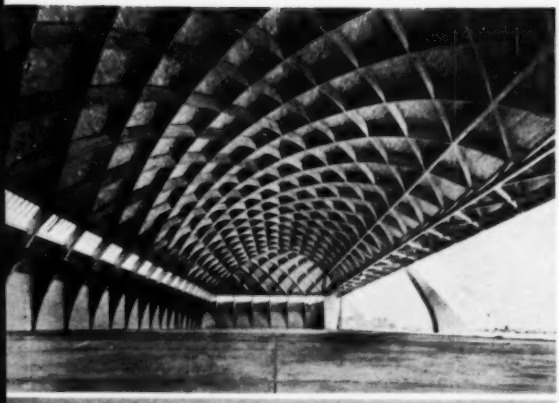
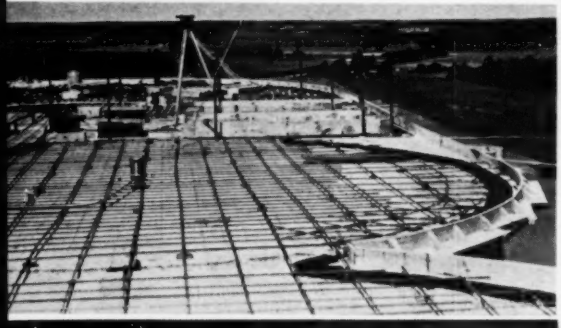
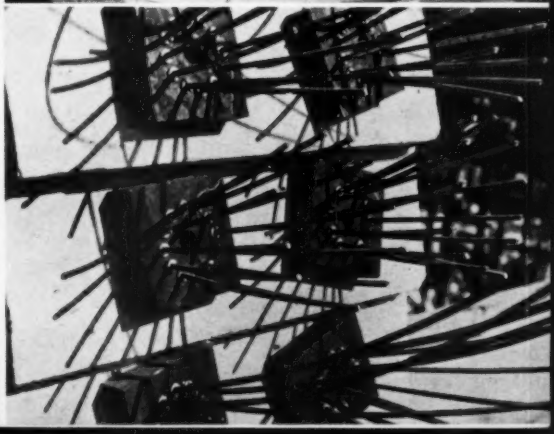
ACI News Letter

Vol. 25, No. 6 JOURNAL of the AMERICAN CONCRETE INSTITUTE February 1954







PREPAKT METHOD SELECTED FOR UNDERWATER PLACEMENT OF CONCRETE COFFERDAM SEALS

Intrusion Grouting of Preplaced Aggregate Used to Embed Forest of Piling for Chehalis River Bridge

Contractor: Mac Rae Brothers, Seattle
Engineer: Washington State Department of Highways

PLAN AT ELEV. -33.0

■ Prepakt is "preferred" again!

This time it's for the cofferdam seals of the two largest piers at the new Chehalis River bridge, Aberdeen, Washington. Embedding closely spaced timber piling at this project introduced complications—but Prepakt's underwater grouting of preplaced aggregate proved to be a neat, cost-saving solution.

The contractor's decision to use Prepakt methods and materials was based on pertinent advantages of this modern technique:

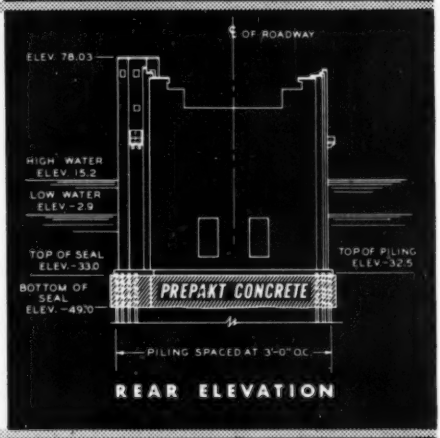
(1) the plant set-up required was small and simple
(2) preplacing of coarse aggregate was quite easy
(3) a rapid grout pumping schedule could be maintained
(4) labor cost savings could be realized

Finally, the close positioning of the 16-foot long piling stubs on 3-foot centers made conventional underwater methods of concrete placement difficult and expensive.

With Prepakt, the coarse aggregate was preplaced in the piers by dump truck and clamshell, then Intrusion Grout pumped in to displace the water and fill all voids. The result—dense, high-strength concrete forming an impermeable, monolithic structure. Some 8000 cubic yards of Prepakt Concrete, designed for a compressive strength of 4000 psi at 28 days, is being placed at Aberdeen.

If you have a construction problem involving underwater concrete placement, why not investigate Prepakt for outstanding economy.

For complete information on Prepakt methods and materials, contact the Main Office, Room 779-K, Union Commerce Building, Cleveland.



REAR ELEVATION

HIGHWAY ENGINEERS *PLEASE NOTE:*

The use of Prepakt concrete in cofferdam seals has been approved for inclusion in future state highway specifications as an alternate to conventional methods. For specific information or engineering assistance, write or wire Prepakt.

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ACI

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Toward ACI Goals

Five years ago the ACI Board of Direction, after an intensive study by a special committee which investigated Institute organization, procedures, and opportunities for service, set up goals toward which Institute affairs would be aimed.

One year after the adoption of these goals, efforts to achieve them were reviewed (*News Letter*, Nov. 1949, pp. 3-5). Now—five years after their establishment and on this anniversary issue occasion—a re-appraisal of what has been done to attain them is enlightening.

An increase in membership to approximately double the present membership in ten years and ultimately to include substantially all persons who would be usefully served by the Institute.

From Oct. 1, 1948, to Oct. 1, 1953, membership increased from 4288 to 6229 or in five years 213 less than one-half the goal of doubling the membership in ten years, which would have required attaining a half-way membership of 6432. The trend in member gains follows pretty much that of other similar societies in that the rapid gains of the immediate postwar period have leveled off to modest but steady increases.

Date	*Net membership*	*Increase for year*
Oct. 1, 1948	4288	
Oct. 1, 1949	4781	493
Oct. 1, 1950	5178	397
Oct. 1, 1951	5382	204
Oct. 1, 1952	5869	487
Oct. 1, 1953	6229	360

In addition to the constant and effective member-getting efforts of individual members, special work toward increasing membership has been done by local regional meeting and convention committees, through the series of three stockholder letters to solicit the cooperation of the general membership, and last fall by the first use of a nomination form on which members listed likely prospects.

Continued on p. 4

The ten-year goal is within reach but only through intensification of the approaches found most productive—individual sponsorship, local committee work, and nominations.

With the standards ballot this spring will go a nomination form. Since 20 percent of those named in the trial use this of method last fall became members, this selective approach has great promise. It is hoped that on its second use far in excess of the 400-odd nominations received last fall will be forthcoming for individual follow-up by the staff.

You know best who among your circle of friends and associates are interested in and will benefit from Institute affiliation. Let *us* know who they are.

Increase in the number of and improvement in the technical quality of papers with particular emphasis on a larger number of comparatively short papers.

As the tabulation below shows, part of this goal—increasing the number of papers—has been in large measure achieved. As to length of papers, the average minimum attainable under present methods of operation seems to have settled at about 12 to 14 pages. Progress has been made toward more diversification in some directions, particularly in design, but further editorial activity is needed.

	Length of ACI papers	
Volume No.	*No. papers*	*Avg. length, pp.*
45	46	13.8
46	62	9.9
47	55	13.1
48	56	14.0
49	68	12.0

Broaden the scope of technical papers to include more of those describing methods of construction, architectural features, and details of techniques successful in obtaining attractive and durable structures.

No spectacular success toward this goal can be reported since a study of classification of JOURNAL papers shows that over the past five years those in this category have comprised 30 to 40 percent of the total (a lesser percentage of total pages) with the latest volume being 34 percent. Construction men being reluctant to write of their doings and the ACI having no field editors make this a knotty problem. Staff attempts to include one paper in this category in each JOURNAL issue are frequently thwarted by lack of suitable papers.

Increase in the quantity and scope of technical committee reports.

Prospects in this field are encouraging despite a backsliding in 1952 in which there were no committee reports. In the year ending June, 1953, there were reports published relating to proposed definitions and notations for prestressed concrete (Committee 323), revision of minimum standard requirements for precast concrete floor units (Committee 711), proposed standard specifications for the design and construction of reinforced concrete chimneys (Committee 505), and proposed manual of standard practice for detailing reinforced concrete highway structures (Committee 315).

Committee reports nearing completion are those on admixtures, structural design of concrete pavements for highways and airports, inspection of concrete, application of paint to concrete surfaces, and high-pressure steam curing. Active research continues on properties of lightweight aggregates and lightweight aggregate concrete, evaluation of results of compression tests of field concrete, rigid-frame bridges, revisions of the building code, recommended practice for design of prestressed concrete, and precast concrete. These later projects have not reached the point where availability of reports can be predicted.

As a further aid to committee work, the Technical Activities Committee is currently reviewing technical committee assignments to determine their adequacy and coverage. Recently organized committees to study residential concrete and structures of concrete masonry units give promise of producing much valuable information.

During the five-year period standards on building code requirements for reinforced concrete, specifications for pavements and bases, and minimum standard requirements for precast concrete floor units were revised and re-adopted, and new standards approved for application of portland cement paint to concrete surfaces and for the application of mortar by pneumatic pressure (shotcreting).

Proposed standards to be considered for adoption at the 1954 convention are "Proposed Standard Specification for the Design and Construction of Reinforced Concrete Chimneys" and "Proposed Recommended Practice for Selecting Proportions for Concrete."

Increase in the technical value and appeal of convention sessions.

More attention has been given in recent years to including subjects of current interest in the convention program. Examples are problems in concrete pavement surface durability, structural design, building code studies, prestressed and precast concrete, admixtures, construction, durability, curing, ultimate load design, and vibration of concrete.

An innovation at the 1954 convention is a general session dealing with economic factors affecting concrete construction and high-level discussions of reasons behind selection of concrete as a material by major construction agencies.

Increase in number of and in the importance of discussions of technical papers and committee reports.

With the cooperation of authors of papers and reports in naming possible discussors, discussion has increased in the past two years as a result of direct solicitation of comments. However, there is still room for improvement here which can be materially aided by spontaneous discussion by readers.

Development of a policy of taking the Institute to the members, such as by increasing the number of regional meetings and holding local conferences.

Since the adoption of these goals, regional meetings—almost wholly organized and conducted by local committees—have been held in Boston, Washington, St. Louis, Chicago, and Houston, with plans for Los Angeles in 1954.

Local conferences have been slower getting underway, although a beginning has been made in Denver with several more of these small group meetings being planned in the Boston area. ACI has also cooperated with a number of universities in sponsoring meetings of a similar but more formalized nature. The ACI staff hopes to be able in the near future to give more direct assistance to bringing ACI closer to the membership through such gatherings.

* * * * *

Despite the passage of five years, the goals established by the Board in 1948 remain logical and realistic targets for Institute endeavor. Greater progress has been made toward achieving some than can be said of others. This half-way look offers an opportunity to re-examine approaches to those in need of intensified effort.

Staff-wise, only three of the present twelve were with the Institute when the 1948 goals were established. Completely new membership and editorial personnel have, in addition to learning the mechanics of their respective positions, shown a deep interest in means for meeting and exceeding the goals. Being close—perhaps too close at times for completely objective appraisal—some effective methods may have been overlooked. *Your* suggestions will be greatly appreciated.

William A. Maples
Secretary-Treasurer

Congratulations

Measured in cubic-yards-placed, the progress of concrete in the past half-century is spectacular. It has always been evident that concrete would lend itself to usage requiring mass. However, not many foresaw 50 years ago that concrete would be so expressively shaped that it would become the dependable and economic medium of construction it is today.

While wisdom and imagination are the requisites for progress, the dissemination of knowledge sets its pace. The ACI not only serves this need, but through its Journal and its active membership imparts responsible leadership to an activity whose future today excites all of our imaginations.

We congratulate the ACI on its Golden Jubilee, fully appreciative of the real value it has been to us during each of the past 50 years.

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Doings in Denver

ACI revisits Denver after a lapse of six years but many who attended that 1948 meeting—setting an attendance record—will recall that the local committee pulled out all stops in demonstrating Western hospitality. Plans for social affairs and those commemorating the 50th anniversary of the Institute bid fair to see even the royal welcome of 1948 eclipsed this year. The Anniversary Dinner on Monday evening, February 22, will honor the half-century of development of ACI and those individuals and firms who have made possible its present stature. Admiral Joseph F. Jelley, Director of Construction, Department of Defense, will make the principal address. Then, on Wednesday evening the local committee is sponsoring a dinner dance, followed on Thursday by a chuck-wagon lunch (with barbecued buffalo) at the Denver Federal Center. On Friday, a choice of inspection trips and scenic tours will be offered.

TUESDAY, FEBRUARY 23

On the more serious side the Technical Activities Committee has arranged a technical program to suit varied interests. At the first general session at the Shirley-Savoy Hotel, Denver, Tuesday morning, February 23, two standards, "Standard Specifications for the Design and Construction of Reinforced Concrete Chimneys," and "Recommended Practice for Selecting Proportions for Concrete," will be offered for adoption by E. A. Dockstader, chairman, Committee 505, and Walter H. Price, chairman, Committee 613, respectively. Raymond E. Davis, past-president of ACI, will summarize the history of the Institute. The second of two ACI-PCA films, "How to Transport, Place, Finish, and Cure Quality Concrete," will be introduced by Professor James A. McCarthy, University of Notre Dame, who headed the ACI Film Advisory Committee which collaborated with the Portland Cement Assn. on the technical content of the film.

The Tuesday afternoon general session will be an innovation in that it will depart from the strictly technical aspects and deal with economic and other factors affecting the selection of concrete for construction. Norman P. Mason, chairman, Construction and Civic Development Department Committee, Chamber of Commerce of the United States, will discuss "Economic Trends Affecting Concrete Construction" and their relation to ACI; Admiral Jelley will consider "Selection of Construction Materials," from the standpoint of a public agency; W. A. Dexheimer, Commissioner of Reclamation will talk on "Use of Concrete by the Bureau of Reclamation;" and Major General Samuel D. Sturgis, Jr., chief of engineers, Department of the Army, will similarly treat, "Use of Concrete by the Corps of Engineers."

The evening session of current motion pictures, which proved so popular in Boston, is to be repeated in Denver on Tuesday evening, February 23.

Continued on p. 11

More and more, hospital designers are turning to reinforced concrete frames and floors, because reinforced concrete costs less. Construction time is important, too, and reinforced concrete buildings *go up faster*.

Reinforced concrete is inherently firesafe. It offers rugged strength that is highly resistant to wind, shock, and quakes. It permits great flexibility of design. And materials are readily available from local sources. Whatever your next building may be — design it for reinforced concrete.

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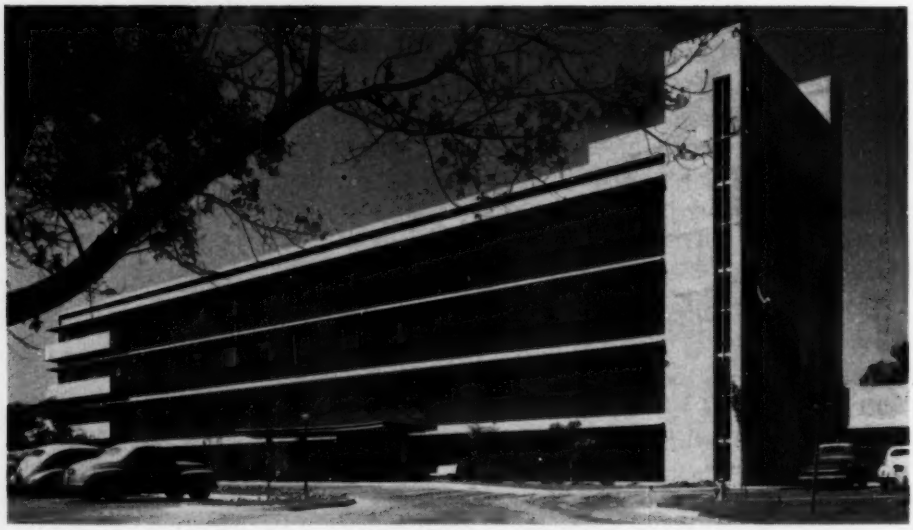


CONCRETE REINFORCING STEEL INSTITUTE

38 South Dearborn Street
Chicago 3, Illinois

Films scheduled are:

"Inside Story of Concrete"
"Navy Builds All-Precast Concrete Warehouses"
"Namao"—Precast Concrete Construction in Canada
"How to Transport, Place, Finish, and Cure Quality Concrete" (second showing)

WEDNESDAY, FEBRUARY 24

Morning and afternoon concurrent sessions will cater to design, construction, materials, and precast and prestressed concrete interests.

Design

The morning session on design leads off with "Resistance of Concrete Structures to Effects of Atomic Blasts," by C. S. Whitney, B. G. Anderson, and Edward Cohen, summarizing the behavior of concrete structures at Nagasaki and Hirashima and at the Eniwetok proving grounds. Design methods discussed will emphasize plastic action and ultimate strength together with practical failure criteria. Typical examples of blast resistant designs and possible design approaches to various problems encountered in blast resistant structures will be described.

In "Inelastic Analysis and Ultimate Load Design of Reinforced Concrete Cylindrical Long-Shell Roofs," George C. Ernst, R. R. Marlette, and Glen V. Berg will report results of tests at the University of Nebraska confirming the authors' ultimate load theory for thin-shell roofs which is a modification of the theories of Baker and Johansen applying to both cylindrical and polygonal shells.

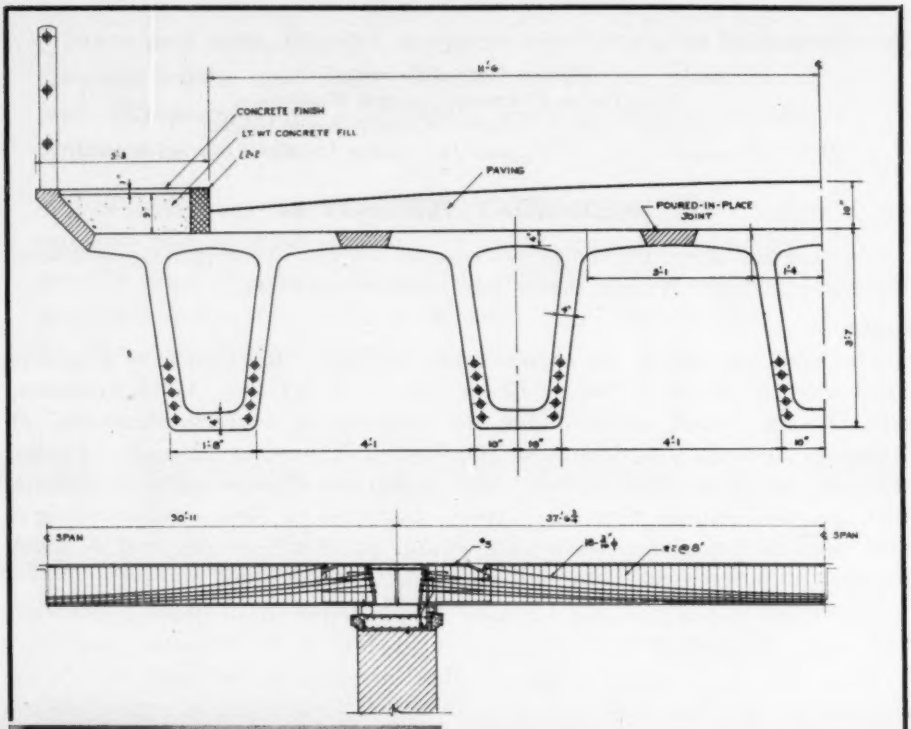
D. H. Pletta and Dan Frederick will report on an ACI Committee 314 project, "Model Analysis of a Skewed Rigid Frame Bridge and Slab." Results will be given of an experimental analysis of a small aluminum model of a skewed-slab rigid-frame bridge and a model theory will be checked using reinforced concrete as the model material with results to show that such models behave as do their prototypes up to ultimate load.

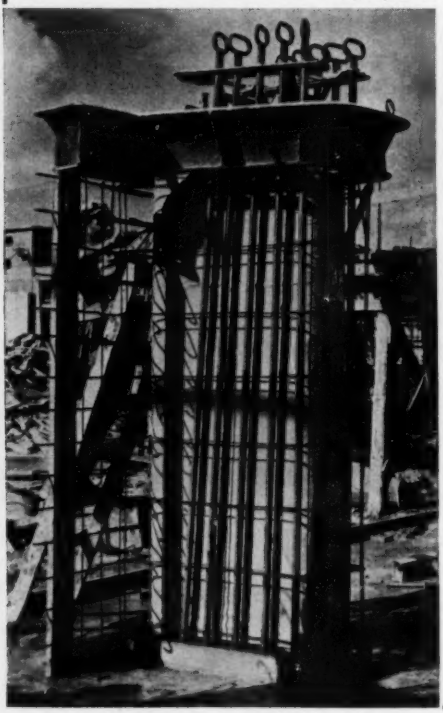
"Design Criteria for Concrete Dams," developed by a Bureau of Reclamation Committee, will be summarized by John J. Hammond. Basic design considerations to be discussed are normal and abnormal conditions for gravity dams, safety factors, and design data. Further details will deal with factors inducing instability and stability in such mass concrete structures.

Gerald Bowen and R. F. Shaffer will give results obtained from a "Flat Slab Solved by Model Analysis," demonstrating true behavior of a flat plate structure falling within the range of empirical formulas. Discussed will be some of the improvements now becoming possible in such structures, and thus increasing their potential usefulness.

Materials and construction

Of interest to the construction minded will be Milo S. Ketchum's "Design and Construction of a Folded Flat Plate Roof Structure." Believed to be the first use of this type of construction in the United States, the 45,000-sq ft





For Prestressed Bridges... One Vacuum Form Makes Nine Precast Bridge Elements Each Day

Hollow sections, 11 ft long, are cast upright in Vacuum Processing forms which are stripped 20 minutes after pouring. With one form, 950 elements for 1500 ft of bridge can be produced in 110 working days.

The project consists of two bridges, total length of 1520 ft, Taormina, Sicily. The contractor is "Ferrocemento," Rome.

●

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equipment firm building in Denver has clear spans of 80 ft in the shop area and other spans of 40 ft and 75 ft; the latter having 25-ft cantilever overhangs. The 6-in. shop roof slabs—thickened at the supports—carry two 15-ton cranes directly on the folded-plate structures.

From Mexico City comes information on "Structural Applications of Hyperbolic Paraboloids," by Felix Candela. He will show the use of such shapes in bus-stop shelters, cantilevered roofs, footings, and factory structures.

Bengt F. Friberg will describe, in "Combined Form and Reinforcement for Concrete Slabs," one-way slab construction in which galvanized corrugated steel serves both as forms and reinforcement. Structural tests will be analyzed and suggestions given for moment distribution in slabs in continuous spans.

Rudolph C. Valore, Jr., will review proprietary "Cellular Concretes" and experimental concretes including moist cured and autoclaved materials. He will compare methods for producing such concretes from the standpoint of economics and of the physical properties of the finished product. Some attention will be given to the potential use of domestic waste materials in the manufacture of cellular concretes.

"Factors Influencing the Strength of Concrete as Revealed by a Six-Year Record of Concrete Control" will form the basis for Joseph J. Waddell's discourse. Several relationships between the different qualities of concrete will be shown which disclose an over-all trend and cyclic variations.

Materials and properties

The Wednesday afternoon session will lead off with a summary by W. T. Moran, chairman, ACI Committee 212, on its soon to be completed report on "Admixtures," encompassing accelerators, retarders, air-entraining agents, gas-forming agents, expanding cements, cementitious materials, pozzolans, alkali-aggregate expansion inhibitors, dampproofing and permeability reducing agents, workability agents, and grouting agents.

W. C. Hansen will report the results of his work on "Effect of Age of Concrete on Its Resistance to Scaling Caused by Using Calcium Chloride for Ice Removal." Tests were made in the field to determine the effect of age of concrete, at the time when de-icing salt was first applied, on its resistance to frost and salt action. Air content is correlated with age of concrete and its resistance to scaling.

"Void Spacing as a Basis for Producing Air-Entrained Concrete," by T. C. Powers, is the result of basic studies showing that the function of entrained air is to protect the cement paste and that the effectiveness depends on the distance from void to void in the paste. It was found that the amount of air required for a given spacing factor is directly proportional to the paste content and is greater the smaller the specific surface of the air voids. A procedure will be suggested for designing a fixed spacing factor where such a procedure is economically feasible.

Work in the concrete products field gives rise to George L. Kalousek's "Fundamental Factors in the Drying Shrinkage of Concrete Block." Over-

all interpretations suggest that drying shrinkage of concrete block at ordinary temperatures is primarily due to the capillary-tension effect only at relatively high humidities, but at moderate and low humidities, it is caused primarily by the desorption of intra-molecular water.

Tests and investigations of existing structures often require determining the amount of materials originally used in the concrete. For the water used —frequently not a matter of record—James S. Blackman describes a "Method for Estimating the Water Content of Portland Cement Concrete at the Time of Hardening." From the total water content of a sample of hardened concrete, after saturation and subsequent drying, the water content at time of hardening is estimated with reasonable accuracy.

Precast and prestressed concrete

Concurrent with the previous session, this meeting will concern itself with design, testing, and factory production of prestressed concrete members and with the manufacture and erection of precast concrete.

In "Sandwich-Type Precast Concrete Construction," F. Thomas Collins will present information on the various types of sandwich-type panels in use in this country and abroad along with the engineering requirements for use of such panels in tilt-up construction. Construction techniques such as forming, screeding, placing sandwich material, curing, handling, and erection will be reviewed.

An unusual 130-ft span "Precast Concrete Hangar" will be described by Otto Safir. Structural requirements—one being that the hangars be demountable for re-erection elsewhere if desired—influenced the design and erection procedure adopted. Results of a full-scale load test of one bent will be summarized and cost figures will be presented.

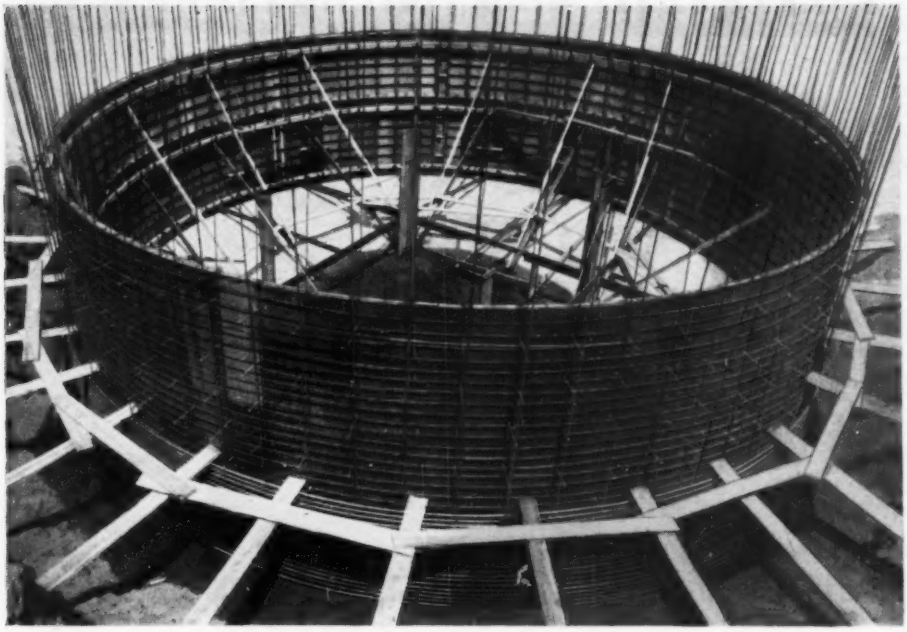
Orley O. Phillips will discuss the "Practical Aspects of Plant Produced Prestressed Concrete," from his experiences in developing a plant to produce pretensioned prestressed concrete members by the long-line process. Emphasized will be the importance of careful and thoughtful planning and, above all, the absolute necessity for close coordination of engineering planning, design, and details with manufacture, handling, and erection.

"Formulas for the Rapid Design of Continuous Prestressed Concrete Members," by E. I. Fiesenheiser, will emphasize the advantages of continuity combined with prestressing and discuss fixed-end moment formulas to assist in making the combination feasible. Line of thrust and kern boundary concepts are advocated.

Of interest to designers and users of prestressed concrete will be P. W. Abele's findings in "Static and Fatigue Tests of Partially Prestressed Concrete Members." Included will be results of fatigue tests showing that when the fatigue loading does not exceed a nominal tensile stress of 650 psi several million repetitions of the load do not affect the subsequent static failure load.

THURSDAY, FEBRUARY 25

With transportation arranged by the local committee, the locale of the



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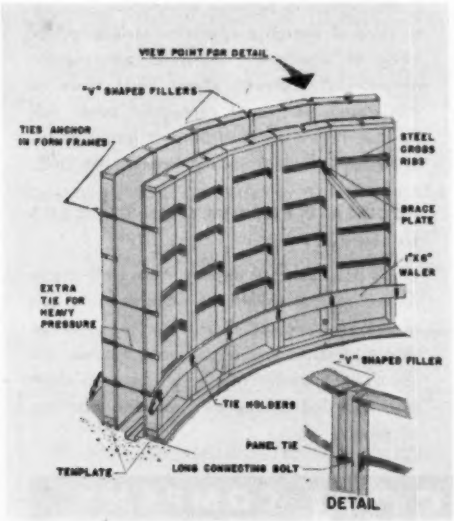

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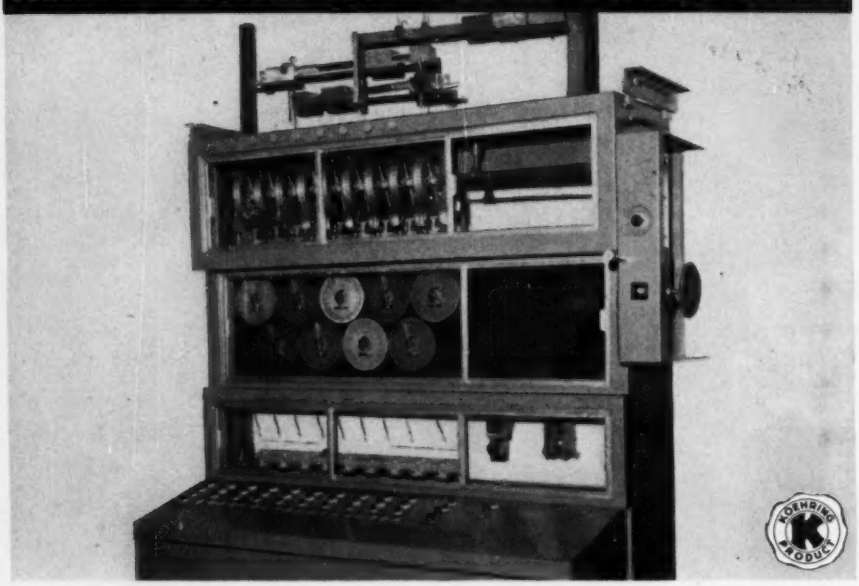

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Chart pens operate directly from scale mechanism, record weight of each material on same sheet. Mixer consistency can also be shown. Electric counter records Batches discharged. Recorder also prints bars on chart paper, saving money and assuring accuracy of register.

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convention moves Thursday morning to the Denver Federal Center where the research session will be held in the theater.

Research session

The annual open meeting of ACI Committee 115, Research, will consist of the usual off-the-record reports of research in progress which has not yet reached the point where results can be released for publication. This year's summaries are expected to include research techniques and preliminary results on fatigue and impact tests of prestressed concrete beams, shear strength of concrete, frame members without shear reinforcement, repetitive loading of precast prestressed concrete bridge members, early strength of concrete, volume change and stress-strain characteristics of concrete, fiber glass tension members as reinforcement, effect of alkalies released by pozzolans on alkali-aggregate reaction in mortar, effect of steam curing and vibration on concrete durability, use of strain gages, and jet blast-resistant concrete.

Tour of Bureau of Reclamation Laboratories

Following a chuck-wagon luncheon, the Bureau laboratories will be open for inspection by convention guests. This will provide an opportunity to see the fine facilities there for investigating the properties of concrete and the equipment for making hydraulic studies of many kinds related to Bureau projects.

FRIDAY, FEBRUARY 26

Inspection trips

The local committee has arranged four inspection trips to points of interest in the Denver area. All-day trips are those to Climax Molydenum and to Berthand Pass. Half-day trips will be to Denver's Dam 22 and another to concrete jobs of interest in and around Denver.

LADIES FUNCTIONS

To entertain the ladies while their husbands are engrossed in their technical interest in concrete, the ladies committee, directed by Mrs. Walter H. Price, chairman, has arranged daily events for them:

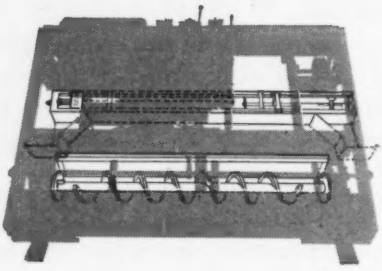
Monday, a.m.—Coffee, Brown Palace Hotel
Tuesday —Luncheon, Broadmoor Hotel
Wednesday —Tea, Wolhurst Club
Thursday —Coffee, Brown Palace Hotel

Room reservations for the Shirley-Savoy, or for other hotels conveniently located, will be facilitated if made through the **Denver Convention and Visitors Bureau, 225 West Colfax Ave., Denver, Colo.**

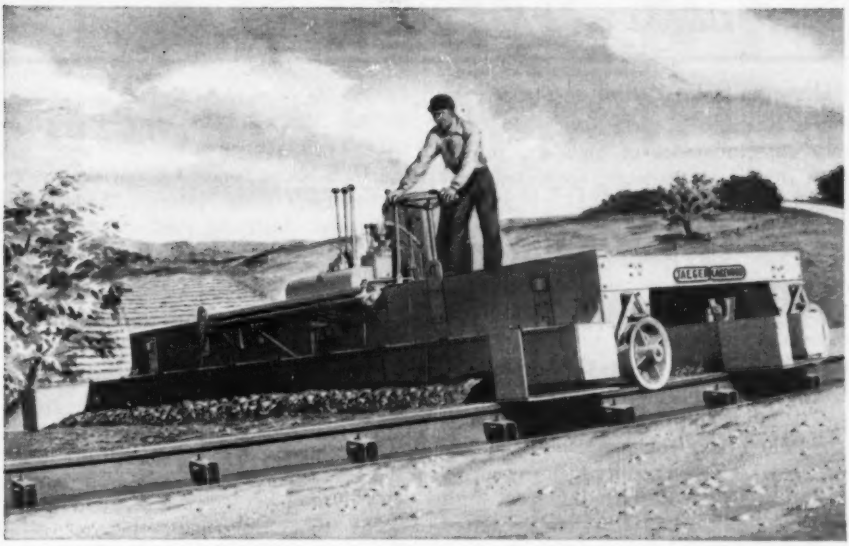
The Spreader and Finisher Team for faster, high-precision paving at Lower Cost!

JAEGER COMBINATION SCREW-SCREED SPREADER

A one-man machine that remixes, spreads, strikes off and then, **by the pass of its 12″ oscillating screed, accurately meters material to the finishing machine.** Insures fast, steady production. Has eliminated second finisher on high production paving. Can complete the concrete base for bituminous surfaced streets. Easily handles the output of two big, dual-drum pavers, eliminates hand labor in the pit, and leaves only precision work for the finisher. Action of its remixing-compacting screw prevents segregation or honeycombing of the concrete, works material against the subgrade and side forms, compacting it into a denser, longer-wearing slab.

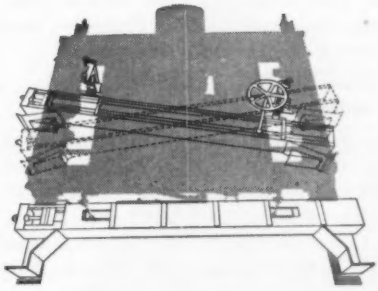


Oscillating metering screed eliminates both excess and deficiency of material ahead of the finisher, insures uniform finish, prevents high spots and the low spots that require costly carryback and interrupt paver production. Finisher can also work farther back from spreader, permitting concrete to condition sufficiently for better finishing and the finisher to make any extra passes that will improve the work. Working range is to 3½″ below the forms, clearance to 3″ above them. Three forward and reverse speeds, plus high travel speed. Two standard models — SS-10 for 10′ to 15′ widths, and SS-20 for 20′ to 25′ widths. Jaeger Model CS-10 and CS-20 Spreaders are identical except that they are not equipped with screed. Special 15′ to 20′ and 25′ to 32′ widths upon specification.



JAEGER TYPE "X" DIAGONAL SCREED FINISHER

Engineered to match the pace of big dual-drum pavers and Jaeger Combination Screw-Screed Spreaders. Front screed transverse, rear screed pivoted and diagonally adjustable in either direction by the twirl of a handwheel.



Precision finishes because its diagonal screed meets the material at a different angle than the front screed — slices off high spots, fills in low ones. Finishes stiff mixtures fast and without tearing, saves extra passes. **Finishes flush to upper form on pitched slab and elevated curves because the diagonal rear screed moves material uphill and compacts it solidly against the form.** Greatly reduces carry back, saves one or two shovelers. Three working speeds forward and reverse, plus high travel speed. Three screed speeds — independent of traction. Screeds have velvet-touch, spring-cushioned finishing action, hydraulic lift, and single-lever quick-crown-change. Two standard models — for 10′ to 15′ widths and 20′ to 25′ widths, each having 5-foot adjustability in 6″ stages. Special widths — 15′ to 20′ and 25′ to 32′.

There are also Jaeger Type "H" Transverse Screed Finishers in standard 10′ to 15′ and 20′ to 25′ widths — special 15′ to 20′ and 25′ to 32′ widths.

THE JAEGER MACHINE CO., Columbus 16, Ohio

Builders of Paving Machines, Mixers, Truck Mixers, Compressors, Pumps, Hoists and Towers

Positions and Projects — ACI Members

Bartelsmeyer named chief engineer

Ralph R. Bartelsmeyer, former St. Clair county superintendent of highways in the state of Illinois, was recently appointed chief engineer for the Illinois Highway Division by Gov. William G. Stratton.

In his new post, Bartelsmeyer will supervise spending of more than $100,000,000 annually on maintenance and rehabilitation of state highways.

Mr. Bartelsmeyer graduated from the University of Illinois as a civil engineer and afterward was employed as a junior engineer for the Illinois State Highway Division before becoming Washington county highway superintendent in 1934. He held that post until 1946. From 1946 to 1948 he was associated with the cement industry in Chicago, and later returned to highway work.

He is president of the Illinois Engineering Council, past president of the Illinois Assn. of County Superintendents of Highways, and a member of the Institute since 1946.

Smith retires

Blaine S. Smith, president, Universal Atlas Cement Co., New York, N. Y., retired recently and was succeeded by Charles B. Baker, executive vice-president. Mr. Smith, who has been associated with Universal Atlas for more than 37 years, will continue with the company in a consulting capacity.

A native of Alta, Iowa, Mr. Smith was educated in the public schools of Chicago, and began his business career with the railroads first as claim adjuster and later as a contracting freight agent.

From 1908 to 1915, Mr. Smith held various positions with the Universal Portland Cement Co. in Chicago and, during the next 13 years, served as general sales manager, and later as director and vice-president. From 1928 to 1936, he was president of the Penn-Dixie Cement Corp. in New York, returning to Universal Atlas as president and director in 1936.

A director of the Portland Cement Assn. since 1925, Mr. Smith was the association's president and board chairman in 1925 and 1926. He is a past director and treasurer of the National Assn. of Manufacturers. Other organizations of which he is a member are U. S. Chamber of Commerce, American Society for Testing Materials, American Iron and Steel Institute, and American Road Builders Assn.

ASTM committees advance work on standards

Significant progress in recent months in the work of several ASTM committees in important fields is reported in the December issue of the *ASTM Bulletin*.

Portland-pozzolan cement

The sponsoring committee on blended cement of ASTM Committee C-1 on cement at its fall meeting at Purdue University accepted the report of a working group on a proposed specification for portland-pozzolan cement, prepared after many months of study and review by the group. After appropriate review and acceptance by the committee, in accordance with ASTM procedures for the promulgation of standards, it is expected the proposed specification will be submitted for acceptance as a "tentative" at the annual meeting of the society in June, 1954.

Natural cement

Committee C-1 also recommended the deletion of "Standard Specification for Natural Cement (C 10-37)," and at the same time recommended the advancement to a standard of the "Tentative Specification for Natural Cement (C 10-52 T)" which will replace the older standard. These actions will also be considered by the society at its meeting in June.

Chemical-resistant mortars

Renewed activity in the field of silicate mortars was reported at the fall meeting of Committee C-3 on chemical-resistant mortars. Classification of several types of silicate mortars will be made, with the subcommittee concentrating on the development of bond, compressive, and tensile strength methods

Continued on p. 23

PLASTIMENT* CONCRETE Ddensifier

CONTROLS SET AND REDUCES WATER CONTENT WITHOUT INCREASING AIR CONTENT FOR

- GREATER UNIFORMITY
- CRACK RESISTANCE
- WATER-TIGHTNESS
- SURFACE HARDNESS

*Plastiment consistently produces higher structural values in concrete because it limits and controls the growth of water-consuming cement gels during mixing and placing of concrete. This action reduces the water-cement ratio and retards the set of all concretes, plain or air-entrained, regardless of type of cement or aggregate. Uniformity of set and water content (the governing factors of uniform concrete quality) are made possible by changing Plastiment proportions with concrete-placing-temperatures and field conditions.

Controlled set and uniformly low water content — exclusive with Plastiment — means less segregation, shrinkage, cold joints and other defects, greater uniformity and resistance to abrasion, cracking and leakage.

Write for your copy of "Plastiment, Concrete Densifier." For specific information on how Plastiment can benefit your own concrete projects, check with our engineering staff today.

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COMPACTOR POWER FLOAT

THE KELLEY COMPACTOR POWER FLOAT PROMOTES EASY WORKABILITY OF RECOMMENDED HARSH, LOW-WATER-CEMENT RATIO MIXES... SPEEDS THE FINISHING OF CONCRETE FLOORS WITH WORTHWHILE SAVINGS IN LABOR AND CEMENT COSTS.

● Action of the compacting hammers on the whirling disc, a patented Kelley feature, compacts and floats out the mix to a smooth level surface, bringing just enough mortar to the surface for troweling.

Better floors are the result of using the Kelley Power Float because coarse aggregate is brought to the surface, giving greater resistance to wear.

The Kelley Compactor Power Float is furnished with either gasoline or electric power head.

Overall durability of the floors is increased. Shrinkage is reduced. Increased density gives high tensile strength.

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THE WIESNER-RAPP CO., INC.
1600 SENECA ST., BUFFALO 10, N.Y.

Continued from p. 20

for chemical-setting sodium-silicate mortar. The present "Tentative Method of Test for Chemical Resistance of Hydraulic-Cement Mortars (C 267 T)" was recommended for advancement to standard at the first opportunity. The subcommittee on hydraulic mortars also will canvass the industry for information on hydraulic cement-latex combinations.

Fly ash

The preparation of a tentative specification for fly ash as an admixture in concrete took a major step forward at the fall meeting of Committee C-9 on concrete and concrete aggregates, at Purdue University. A draft of the proposed specification was reviewed in detail by the subcommittee and the final draft will be circulated to the subcommittee for letter ballot. In view of the changes in the final draft of the specification, it will now be necessary to rewrite the "Test Method for Fly Ash as an Admixture for Portland Cement Concrete (C 311-53 T)." The proposed specification and the revised tentative will be presented to the parent Committee C-9 simultaneously for recommendations as to adoption as ASTM "tentatives" of the society.

Significant developments were reported in the study of chemical reactions of aggregates and concrete, and the subcommittee dealing with this subject presented a draft of a proposed tentative method of test for potential volume change of cement-aggregate combinations.

"Significance of Tests of Concrete and Concrete Aggregates," *Special Technical Publication* No. 22, sponsored by Committee C-9, will be superseded by an entirely new edition which will include the significance of properties, as well as tests of concrete and concrete aggregates.

Special Libraries Assn. translations pool

A new translations service was announced recently by the Special Libraries Assn., in cooperation with the John Crerar Library, Chicago, Ill.

The association has deposited in the Crerar Library 1300 translations which form the nucleus of the pool. In the near future a list of these will be available for distribution.

LOOKING AHEAD

February 19-20, 1954—Spring Meeting, National Society of Professional Engineers, Hilton Hotel, Albuquerque, N. M.

February 22-24, 1954—37th Annual Convention, National Crushed Stone Assn., Conrad Hilton Hotel, Chicago, Ill.

February 22-25, 1954—Golden Anniversary Convention, American Concrete Institute, Shirley-Savoy Hotel, Denver, Colo.

February 24, 1954—4th Annual Convention, American Concrete Agricultural Pipe Assn., Fairmont Hotel, San Francisco, Calif.

February 25-27—46th Annual Convention, American Concrete Pipe Assn., Fairmont Hotel, San Francisco, Calif.

June 14-19, 1954—Atlantic City Convention, American Society of Civil Engineers, Chalfonte-Haddon Hall, Atlantic City, N. J.

July 11-21, 1954—Sixth Pan American Road Congress, American Road Builders' Assn., Pan American Division, in cooperation with the Venezuelan government and Western Hemisphere engineers, Caracas, Venezuela

Because the usefulness of the pool will be in direct proportion to the number of translations available, contributions are solicited from government agencies, technical societies, universities, industries, and individuals. Contributions may be made by the deposit of good copies of complete translations. If copies are not available for deposit, they may be lent to the Crerar Library for a short time, with permission to microfilm, or alternatively, a 35-mm microfilm may be deposited.

Contributions and requests for information regarding the availability of translations should be addressed to:

SLA Translations Pool
John Crerar Library
86 E. Randolph St.
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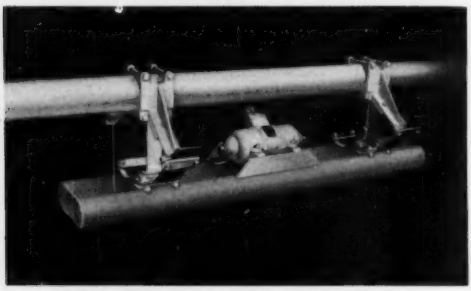
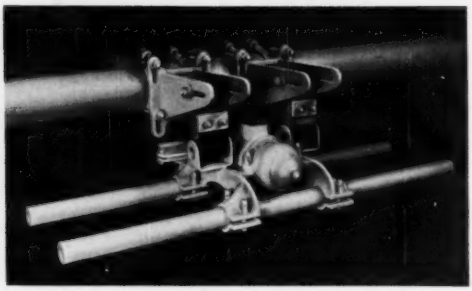
JACKSON *Most* ADVANTAGEOUS

for TOLL ROAD—AIRPORT—HIGHWAY and MUNICIPAL CONSTRUCTION — MACADAM BASE COURSE—



SURFACE TYPE PAVING TUBE.

Tube vibrates on surface, transmitting tremendous energy to the freshly spread concrete. Accomplishes thorough densification of 10″ concrete slabs. One unit as shown, for each 6′-0″ (maximum) of slab width. Usually attached to rear of spreader. May be quickly changed to INTERNAL vibration, thus meeting both types of specifications at minimum cost. Thoroughly puddles at side forms. Powered by Jackson Portable Power Plant on parent equipment.

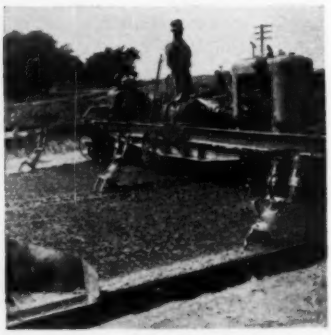


INTERNAL TYPE PAVING TUBE.

Supplied with extraordinarily powerful motors, no concrete highway or airport paving job is too tough for this improved machine. Tubes vibrate deep in concrete. One unit, as shown for each 5′-0″ (maximum) of slab width. Usually attached to front of finisher. Quickly plasticizes harsh, dry mixes in slabs 6″ to 24″ thick and as wide as 25′. Cuts spreading costs where no spreader is used. Quickly convertible to SURFACE vibration when desired.

SIDE FORM VIBRATOR. ▶

Eliminates manual vibrating of concrete at side forms. Saves the better part of two men's labor. Mounts on any modern finisher or spreader. Employs two or more vibratory units that are simultaneously lowered into or raised from the concrete by finisher operator. Units operate close to forms or reinforcement. Will not snag or penetrate into sub-base. Assures perfect compaction regardless of speed of finisher or spreader.



VIBRATORS FOR GENERAL AND MASS CONSTRUCTION—POWER PLANTS. Model FS-6A: 6 HP engine driven, flexible-shaft vibrator. Model FS-150A: 2½ HP electric, flexible-shaft vibrator for light-socket operation. VS-4 electric vibrator for dams and other mass construction. Internal and external form vibrators. 1.5 to 7.5 KVA Portable Power Plants which produce both single and 3-phase 120 V, 60 Cy. AC.

ELECTRIC TAMPER & EQUIPMENT CO. — and

VIBRATORY EQUIPMENT

CONCRETE PAVING—GENERAL CONSTRUCTION—MASS SUB-BASES FOR CONCRETE FLOORS, PAVEMENT WIDENING

MUNICIPAL PAVING.

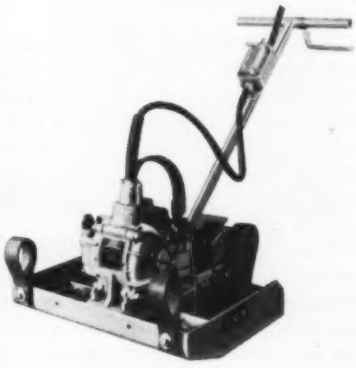
The Jackson Electric Vibratory Screed is unequalled for low-cost municipal concrete paving, highway widening and patching, bridge decks, floors, etc. Will undercut at side forms, roll back for second passes, strike off crowns, both regular and inverted, permit operators to work from front, rear or sides. Works right up to and around sewers, manholes and other obstructions. Does excellent job of vibrating reasonably workable concrete to depth of 10″ in slab widths of 6′ to 30′. Powered by Jackson Portable Power Plant.

MACADAM BASE COURSES.

The Jackson Multiple Vibratory Compactor in one pass will sufficiently compact 12 inches of rock to support smooth rollers. In four passes, this machine keys and compacts to final density. Just two passes completely fill voids from top to bottom of the course, when enough dry fines are spread. Consists of 6 integrated units with total width of 13′, 3″. Working speeds of 0′ to 60′ per min. and reverse travel speed of 5½ M.P.H. Each of the 6 units may be detached and used as a self-propelled individual compactor to handle restricted areas. Units may be grouped in tandem and towed at side of tractor on widening courses. Interchangeable bases to fit requirements are available.

SUB-BASES FOR CONCRETE FLOORS PAVEMENT WIDENING STRIPS, etc.

The individual Jackson Compactor is an exceptionally efficient tool for compacting granular soils in areas adjacent to bridges, abutments, etc., in trenches, sub-bases for floors and many other places. Self-propelling, it delivers up to 4500 1¾ ton blows per minute and will compact upwards of 1800 sq. ft. per hour in depths of 8″ to 12″ to Standard Proctor. Operated from Jackson Portable Power Plant.



JACKSON VIBRATORS, Inc. - Ludington, Mich.

WANTED — TIMBER

This editorial is reprinted from the June 1953 JOURNAL to again call attention of ACI members to the opportunities available for participating actively in ACI committee activities.

Yes—human timber to build a backlog of qualified individuals for future service on ACI's technical committees. The Technical Activities Committee views with concern the fact that only 282 individuals make up ACI's 31 technical committees. Thus, with less than 5 percent of ACI's 6100 members active in committee work, TAC is convinced that much member talent remains undiscovered and unused in this most important ACI activity from which come the reports and Standards which are the authoritative voice of the Institute.

What's the remedy? The silent 95 percent must provide it by making known their interest in and qualifications for committee assignments so that TAC may, from the information furnished, recommend new appointments to existing committees and select personnel for new committees which may be organized in the future.

It has been said that knowledge pent up within an individual is of little value—only when it is transmitted to others does it establish its true worth. Only you know your most engrossing interests and your technical fortes. Only you can apprise those responsible for committee affairs of your potential for participation in technical work of the Institute.

Look over the list of technical committees and write ACI headquarters about your technical background and designate that committee on which you would like most to serve. (Detailed information on committee assignments may be found on pp. 23-33, *ACI Directory–1953*.) Secondary choices will also be of interest.

Since relatively small committees have proved most effective and the process of infusing new personnel into committees is necessarily slow, immediate appointment to the committee of your choice may, of course, not be possible. However, be assured that when vacancies occur or new committees are formed your qualifications will be given fullest consideration.

PROFESSIONAL CARDS

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Civil & Industrial Engineers
Design, Supervision, Testing, Development
Special Structures, Airports, Tunnels, Highways, Dams, Concrete Products, Ready Mixed Concrete.
Office & Laboratory Brookline, Mass.

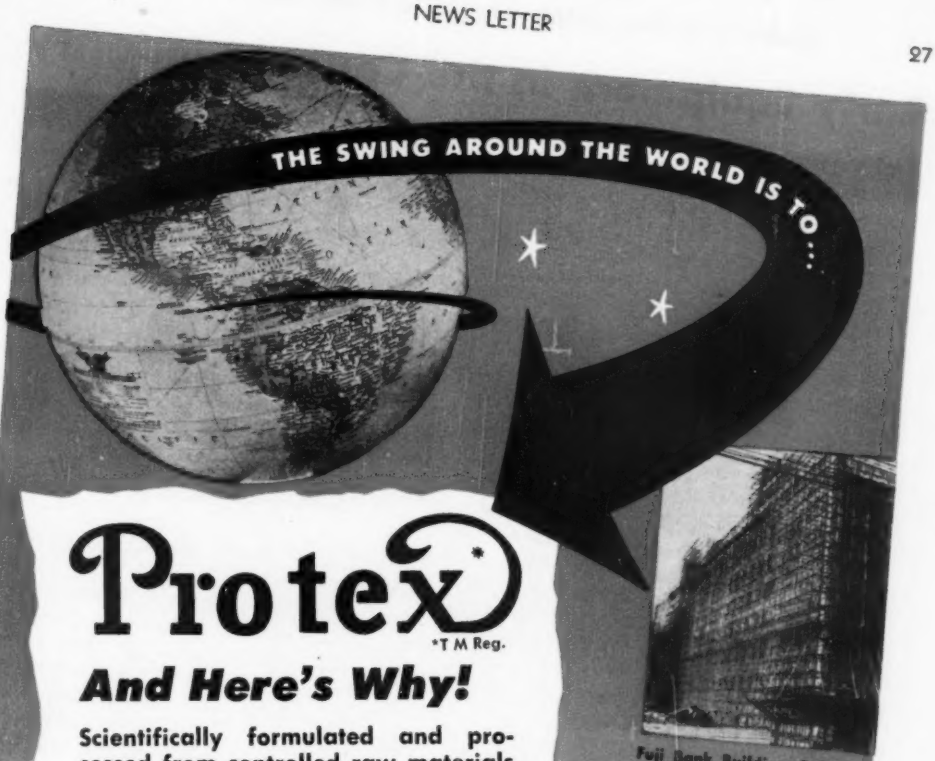
Reviewers needed

Gradbeni Vestnik

This Yugoslavian technical periodical is now being received regularly at Institute headquarters. A volunteer reviewer is needed to keep Members informed of pertinent papers in this publication through the "Current Reviews" section of the JOURNAL. Those interested please write the Secretary.

Zement-Kalk-Gips

This German technical periodical is now being received regularly at Institute headquarters. A volunteer reviewer is needed to keep Members informed of pertinent papers in this publication through the "Current Reviews" section of the JOURNAL. Those interested please write the Secretary.



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And Here's Why!

Scientifically formulated and processed from controlled raw materials under exacting Laboratory control to do a positive job of controlling the entrained air in a concrete mix at a minimum cost. Our leading Industrial Organization's Research and Control facilities is producing a superior Air Entraining Agent FOR ALL TYPES OF CONCRETE. That's the reason for the BIG SWING to PROTEX in the millions of yards of placed concrete Around the World.

This monumental tribute in concrete stands like a beacon of positive proof that PROTEX quality and reliability—coupled with honest dealings and fair prices is what the user wants. Let your PROTEX Representative give you all the facts, and experience your savings with Superior PROTEX.

Fuji Bank Building, Tokyo, Japan. Economy in this new bank building was realized in initial cost and time—and appearance was permanently improved with Protex concrete.

Hungry Horse Dam, Mont. Over 3 million cu. yds. of Protex concrete, selected for its consistent controlled air quality and proven economy, with no yield loss in placed concrete. Comparative tests at the project proved that, regardless of claims or names, none were as effective as PROTEX.

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Please send free booklet, "Facts on Modern Placement of Concrete Through Air Entrainment."

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Early Equipment in the Concrete Industry

In keeping with the keynote of this issue commemorating 50 years of progress in the concrete industry, it is striking to note the evolution and development of machinery used in various manufacturing processes. Today in this era of highly specialized labor and machines, with machinery taking the brunt of production schedules, it is, perhaps, unusual for many to regard this as not always being so. Machinery in the concrete field has kept pace in developments, just as in other fields. With new construction techniques, increasing product demand, and rising costs there has been an "industrial revolution" in the concrete industry.

Much of this mechanical progress can be traced by referring to early issues of technical publications such as the *Proceedings* of the National Assn. of Cement Users, later to become the *Proceedings* of the American Concrete Institute and still later the JOURNAL OF THE AMERICAN CONCRETE INSTITUTE and other trade magazines. Perhaps by describing some early equipment referred to in these publications, the contrast between early and present-day manufacturing techniques in the concrete industry may be pictured more clearly.

Masonry unit manufacture

Publications around 1905 carry information on early manufacture of masonry units.

Reference is made to block made in a "cast-stone press" from adjustable molds with either hollow or solid shapes. Other block-making apparatus described is an unusual machine for manufacturing T-shaped block for hollow concrete walls and partitions. The block were set with the stem against the lower inside "T" of adjacent block, thus forming in plan the conventional shape used today *i.e.*, the block wall had solid sides and hollow cores with the ribs being the stems of the T-sections. An unusual feature claimed for these block was horizontal slots between units for a continuous air space. This was to prevent moisture penetration and to provide an insulating blanket against heat and cold.

Fig. 1—Early block machine

Fig. 2—Early block machine for producing architectural surfaces on block

An early block machine in operation is shown in Fig. 1. Note the hand press for applying pressure to the mix and the fold-over sides on the molds.

One-man cement, steel brick presses were described in which materials were placed in molds and then compressed by a triple compound lever to produce a smooth brick with clean, sharp edges. Capacity was given as 1200 to 3000 pressed brick per man per day.

The importance of architectural surface treatment of block was expounded by some as being essential to the successful promotion of this product in above-grade construction. Accordingly machinery was brought out with interchangeable molds to provide various surface treatments on block (Fig. 2). Manufacturers played up this

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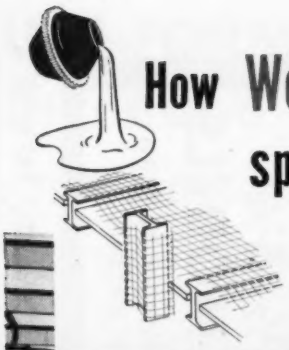
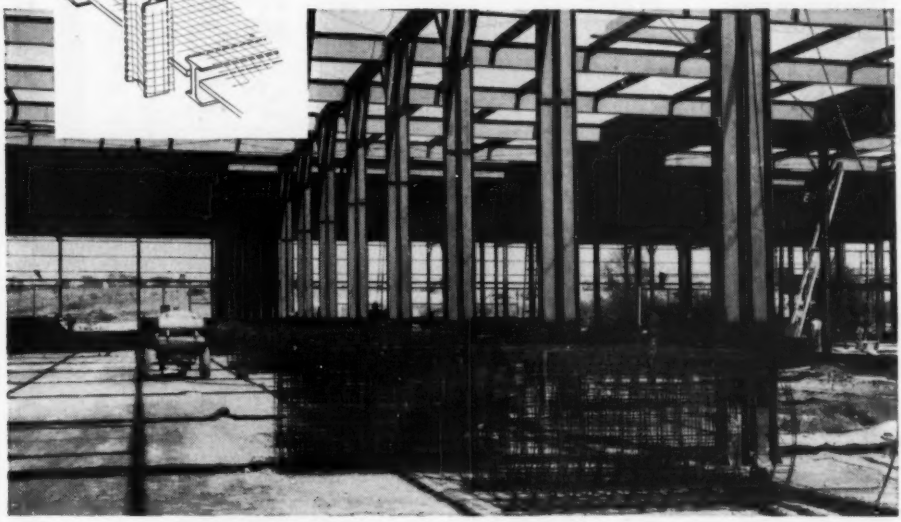


How Welded Wire Fabric speeds up building construction



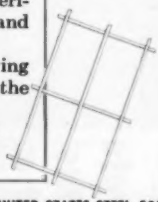
GET A JUMP ON THE WEATHER

order your Wire Fabric NOW!

When the weather breaks next spring, you will want to dig in *at once* on all important construction jobs. You will need plenty of American Welded Wire Fabric on hand ready for immediate use.

The best way to be sure of having enough is to stock up *now* on the sizes and styles you will use.

Get in touch with your local supplier today.



IN short-span concrete floors, you just unroll American Welded Wire Fabric reinforcement into place and let it droop continuously from beam to beam (see ACI Building Code, Sec. 505b). The long prefabricated rolls guarantee continuity of reinforcing action and speed up installation.

American Welded Wire Fabric takes less steel, too. It is allowed a working stress about 40% higher than ordinary reinforcing materials (ACI Building Code, Sec. 306). As a result you get the needed strength in reinforced short-span floors with about 28% less steel area. With American Welded Wire Fabric, you have less material to transport and unload at the job. This cuts labor costs.

Write to our nearest sales office for complete information.

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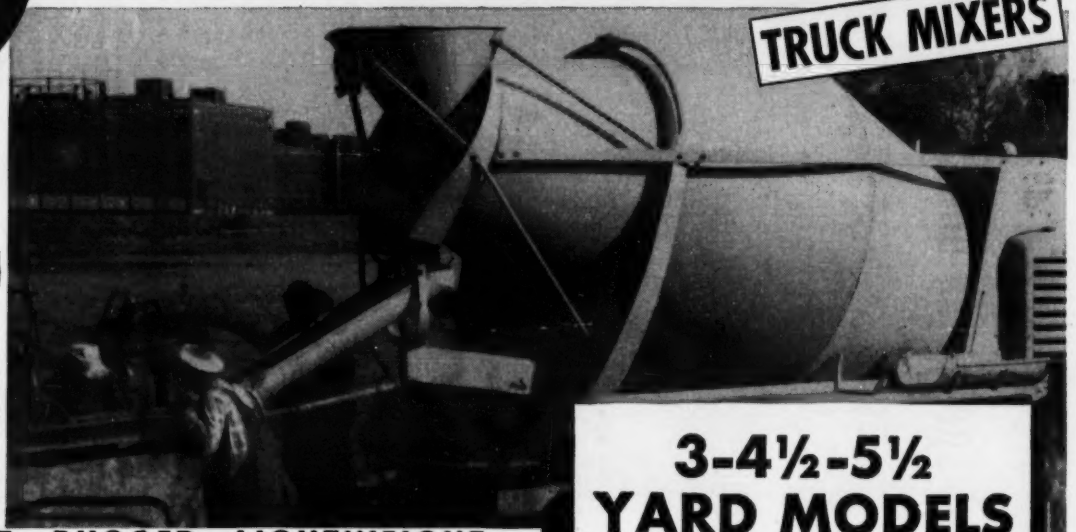
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

EVERY TYPE OF REINFORCED CONCRETE CONSTRUCTION NEEDS

U·S·S AMERICAN WELDED WIRE FABRIC

UNITED STATES STEEL

TRANSCRETE



Puts More Payload on the Road — More Concrete in the Forms

MAKES MONEY FASTER!

3-4½-5½ YARD MODELS

WITH PERMISSIBLE ½ YARD ADDED RATING

LOW COST — RUGGED — LIGHTWEIGHT

- Thoro-mix action. Mixes and discharges all slumps.
- Simplest of all. No maintenance or service problems.
- Now available as 3 - 4½ - 5½ yard mixer.
- Bureau rated and job tested.

CONSTRUCTION MACHINERY COMPANY, Waterloo, Iowa

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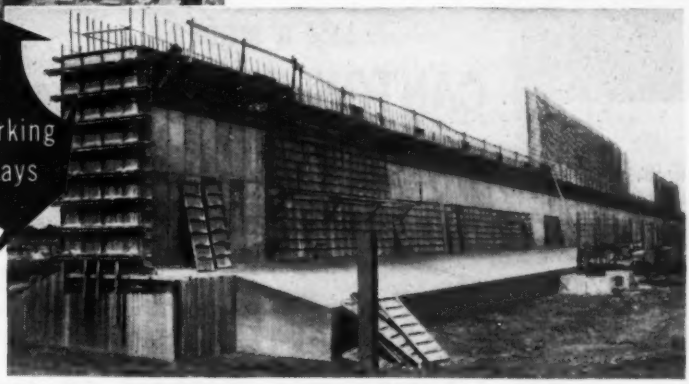

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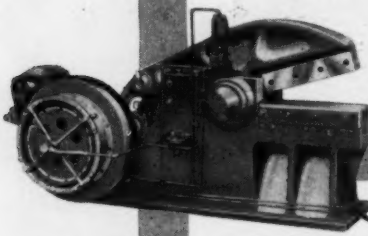

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Early Equipment
Continued from p. 28

phase by various statements in connection with making their product known such as "every machine is a complete stoneyard in itself." Some manufacturers were already production conscious and brought out block machines that would produce block "two at a time." Popular acceptance was courted by reference to adoption of the "two at a time" machine by the government and the Panama Canal Commission. Still another manufacturer brought out a machine to produce hollow, triangular block with adjustable dimensions which was said to produce 350 to 600 block or 6000 brick in 10 hr.

Other fields were also being investigated by masonry-unit manufacturers such as the cement-shingle field. One such machine is described as being operated by one man and capable of productng 1½ squares per day.

Mixers

Early in the history of the concrete industry the advantages of mechanical mixing were recognized, but, as will be seen, each manufacturer had his own idea as to the shape and principles of concrete mixers. One manufacturer boldly stated "a good mixture from a Miracle mixer," was to be expected from his cube-shaped mixing drum. Other assertions for the cube-shape in mixing concrete were that:

"The principle of the cube has been tested and demonstrated as by far the best principle for thoroughly mixing concrete. Three revolutions of the cube renders a perfect mix, the materials being broken and assembled 18 times."

Popularity of the cube-shape is attested to by other manufacturers, and thoroughness of mixing seems to be the main advantage enjoyed by mixers using the cube-shape. Modifications in mixing were evident in that some products used engines and others hand labor to rotate the drum. Of course, machines using an engine produced a more uniform mix and used this as a selling point. A common test was to charge red oxide of iron into the mix and then to observe the uniformity of color in the hardened concrete. Most machines rotated on a diagonal axis of the cube which was horizontal in most cases. Mixers rotating around a horizontal axis were provided with a trap door to prevent contents from discharging when being rotated, or else rotated with the opening in a raised position.

In the early development of mixers it was thought that use of interior devices in the drums was a detriment to thorough mixing, in fact, one manufacturer stated:

"It is manifest that any form of paddles, scoops, shelves, or blades in a mixing receptacle will become *coated with cement* and form *pockets* which will *scoop up* as much as they will hold of some *ingredient* as it enters and this material is carried around by these devices, cutting through but not mixing with the main mass at the bottom of the mixing chamber and simply *slides out* when the batch is discharged producing a *streaky concrete.*"

Other mixer manufacturers disagreed with these views and produced cylindrical drum machines with and without paddles.

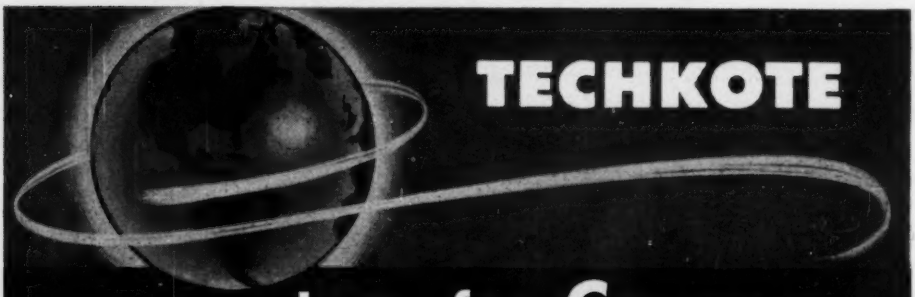
Motivation of these machines was by (1) hand, (2) portable engines, (3) stationary engines with belts and flywheels transmitting the power, and (4) steam. Perhaps the most unusual type was a mixer with the steam boiler and engine attached directly to the mixer frame. The general appearance was somewhat like the Tom Thumb locomotive of railroad fame.

Cement-making machinery

Early machinery in cement manufacture was available in much the same manner as today. Important differences were in size and methods used for operation—the early part of the 20th century was dependent on steam power with transmission of power by belts and heavy flywheels, whereas today efficiency and safety demand some form of power transmission less costly and less hazardous. Machinery is advertised for every phase of cement making, by either the wet or dry process, such as rock breakers, crushers, dryers, elevators, ball mills, tube mills, kilns, and conveyors.

Conveyors were made of units shaped like flat-bottom boats to prevent cement clinker or other gritty material from spilling. Importance of pulverizing equipment was stressed in describing mills with fineness of ground material being a primary requisite.

Continued on p. 57



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Problems and Practices

Second of a series relating to "down-to-earth, everyday" concrete problems. This series, presented in question and answer form, attempts to give brief answers to the more common (and sometimes uncommon, too) questions asked about concrete design and construction practices.

To some, the answers will seem simple and obvious; others may prove to be extremely controversial.

All ACI members are invited to participate —either by submitting an inquiry, or even better, by telling JOURNAL *readers how an intriguing problem was solved. It may well be that readers will be able to suggest more practical solutions to inquiries than those presented.*

Q. At what age may concrete be frozen without damage?

A. Even a single freezing almost always affects the strength and durability of a concrete frozen while still plastic or during the initial hardening period. If definite traces of ice crystals at the boundaries of coarse aggregate particles can be found in the concrete, it has been definitely harmed.[1]

Various investigations on frozen concrete have shown that compressive strength is usually reduced by 10 to 50 percent. Also, when concrete containing "turkey tracks" running through it, made by the formation of ice crystals, is exposed under severe conditions, there will usually be disintegration.[2,3]

ACI Committee 604 noted in "Recommended Practice for Winter Concreting Methods (ACI 604-48)"[4] that the exact limits of the critical period when concrete may be seriously damaged by one or two cycles of freezing are uncertain. The limits are doubtless affected by many factors in the composition and manufacture of the concrete. The major factor affecting the limit of the critical period is the rate of strength gain of the concrete.

The committee reported that experience and meager laboratory tests indicate that if the concrete has attained a compressive strength of more than 500 psi, it may not be too seriously damaged by one or two freezing cycles.

Donald C. McNeese in a report of a limited series of tests, "Early Freezing of Non-Air-Entraining Concrete,"[5] noted that if the concrete is placed at 75 F, it must be subjected to severe freezing within about 6 hr for any appreciable damage. If it is placed at 40 F, even a mild freezing temperature of 25 F may destroy 50 percent of its strength. If frozen while plastic and then thawed at 75 F, concrete will still lose about 45 percent of its strength, he noted. It should be emphasized that these limits should be used with caution since the investigation was limited in scope.

* * * *

Q. Can concrete which has been frozen be recovered?

A. If thawed out without being disturbed and good conditions are maintained, concrete will acquire considerable strength. But —available tests indicate that it will never attain its full potential value.[6] Concrete that has been frozen can be enclosed with tarpaulins, or any other suitable enclosure, and live steam applied.[2] Since the thawing concrete again exerts pressure against the forms, these often have to be reinforced. The thawing of multistoried buildings should start from the bottom. A. Kleinlogel[7] reports that, using slotted pipes through which warm water drops, it takes from 1 to 2 days to thaw a wall 10 to 16 in. thick, and from 2 to 4 weeks to thaw a wall 8 to 10 ft thick. After the concrete is completely thawed, standard methods of curing should follow.

It should be emphasized that the *best* results are obtained for the structure when proper protection keeps the concrete from freezing.

* * * *

Q. What special precautions should be taken in case concrete has frozen?

A. It is particularly important to keep it from drying out after having thawed. Flooding with warm water and keeping the surrounding air above 70 F would be the best treatment.[6] Because of its low absolute humidity, winter air has a great avidity for water when its temperature is raised, so that an unprotected concrete structure dries out rapidly.

Continued on p. 36

Problems and Practices
Continued from p. 35

Selected references.

1. "What to Expect of Frozen Concrete," (JPP 36-59), ACI JOURNAL, June 1940, *Proc.* V. 36, pp. 686-687.

2. "Frozen Concrete," (JPP 39-113), ACI JOURNAL, Nov. 1952, *Proc.* V. 39, pp. 127-129.

3. "Frozen Concrete Cheaply Repaired," (JPP 41-156), ACI JOURNAL, Sept. 1944, *Proc.* V. 41, pp. 56-59.

4. ACI Committee 604, "Recommended Practice for Winter Concreting Methods," available in separate covers at 50 cents each from Institute headquarters; originally published in ACI JOURNAL, Sept. 1948, *Proc.* V. 45, pp. 1-18 (also lists 135 selected references on winter concreting).

5. McNeese, Donald C., "Early Freezing of Non-Air-Entraining Concrete," ACI JOURNAL, Dec. 1952, *Proc.* V. 49, pp. 293-300 (also lists 15 selected references).

6. McMillan, F. R., *ACI Concrete Primer*, available at 35 cents each from Institute headquarters, p. 10.

7. Kleinlogel, A., *Influences on Concrete*, Frederick Ungar Publishing Co., New York, N. Y., 1950, pp. 99-104.

Errata

The following correction should be made in "Stirrup Design," ACI JOURNAL, January, 1954.

p. 396—the first sentence in the third paragraph should read as follows:

"The writer's solution is exact and general, that is to say, the shear diagram may be a trapezoid as well as a triangle, whereas, the author's method is an approximation of the triangular case."

J. Herbert Davies

J. Herbert Davies, consulting engineer, Long Beach, Calif., died recently. Mr. Davies held two engineering degrees from Ohio State University, and worked for that state's division of highways before going to California. He was a structural engineer with the Long Beach building department for six years before opening his own office in 1933. He was an engineer on bridges, industrial and commercial buildings, schools, and other public buildings, airports, and military installations.

Percy Coleman Kuhn

Percy Coleman Kuhn, for the past ten years consulting structural engineer in New Orleans, La., died recently. Early in his career, Mr. Kuhn was associated with the Truscon Steel Co., as manager of its New Orleans office and, during World War II, was in charge of naval repairs for the Todd-Johnson Dry Docks. Mr. Kuhn was a 1922 graduate of the University of Virginia.

Russell David Rogers

Russell David Rogers, former senior civil and architectural engineer, E. I. du Pont de Nemours and Co., died recently. He was a former president of the National Society of Professional Engineers. He drew up the original building code for Wilmington, Del., and was honored by the federal government for work on the atomic bomb during World War II.

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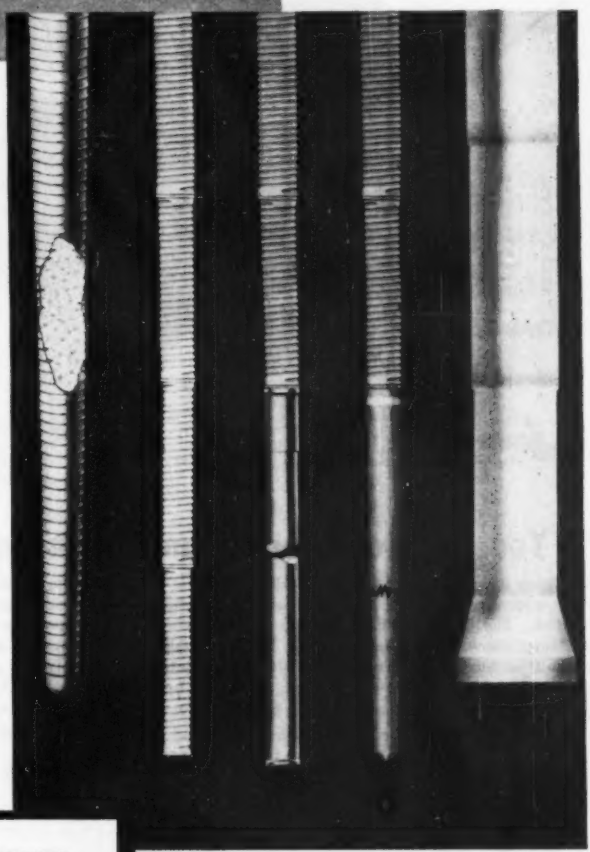

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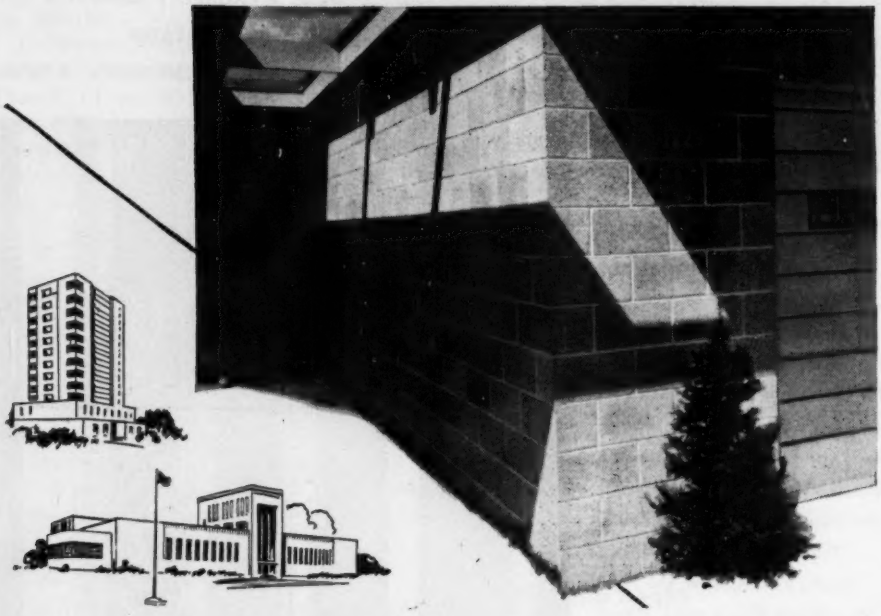

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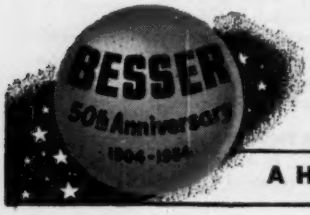

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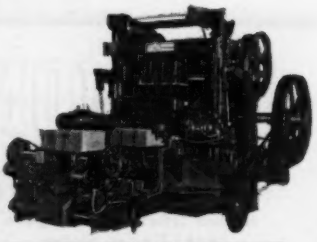

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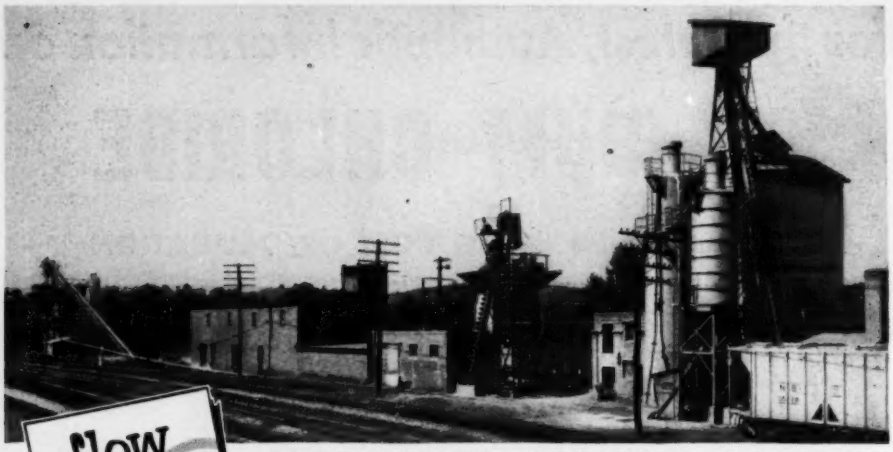

Overall view of plant. Main cement-storage bins, car unloading station, and block plant, right. Ready-mixed plant, extreme left. Approximate conveying distance from inloading station to ready-mixed plant, 700 feet.

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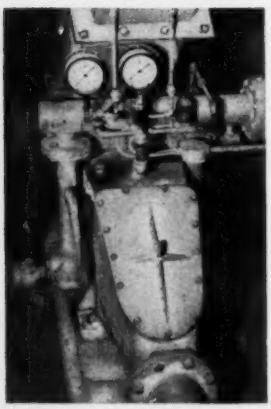

Fuller-Kinyon Pump for unloading and conveying to storage and ready-mixed plant.

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Who's Who This Month

William A. Maples and Robert E. Wilde

"A Story of Progress—Fifty Years of the American Concrete Institute," p. 409, was collaborated on by William A. Maples and Robert E. Wilde, secretary-treasurer and managing editor, respectively, of the American Concrete Institute.

Frank Kerekes and Harold B. Reid, Jr.

"Fifty Years of Development in Building Code Requirements for Reinforced Concrete," p. 441, are described by Frank Kerekes, assistant dean, Division of Engineering, Iowa State College, Ames, Iowa, and Harold B. Reid, Jr., Structural engineer for L. H. and B. L. Nishkian, consulting engineers, San Francisco, Calif.

Professor Kerekes received a BS degree from the City College of New York in 1917 and a CE degree from Columbia University in 1920. He joined the faculty of the department of civil engineering, Iowa State College, as assistant professor in 1920-25, was associate professor 1925-30, professor of civil engineering 1931-47, and has been assistant dean since 1947.

Professor Kerekes has been an ACI member since 1938 and is chairman of ACI Committee 318, Standard Building Code, and a member of Committee 315, Detailing Reinforced Concrete Structures. He has been active on ACI technical and administrative committees, is a member of the Board of Direction, and was a member of the Technical Activities Committee. He has also served as chairman of the Iowa Building Code Council.

Mr. Reid received his academic training at Ohio State University and at Massachusetts Institute of Technology, receiving a BS degree from the latter in 1950. His experience has been both in architecture and in engineering, including work with the Turner Construction Co., Boston, Mass; Goldberg, LeMessurier and Associates, Boston; Tibbals, Crumley, Messon, architects, Columbus, Ohio; as well as designing a number of buildings on his own.

J. L. Peterson

J. L. Peterson, author of "History and Development of Precast Concrete in the United States," p. 477, is president, J. L. Peterson, Inc., consulting engineers, Los Angeles, Calif.

Following graduation from the University of California in 1942 with a BS in civil engineering, Mr. Peterson spent two years with Kaiser Engineers, Oakland, Calif., working on the design of the Fontana Steel plant. Military service with the U. S. Army, Corps of Engineers, Manhattan District, followed with two years spent at Los Alamos, N. M.

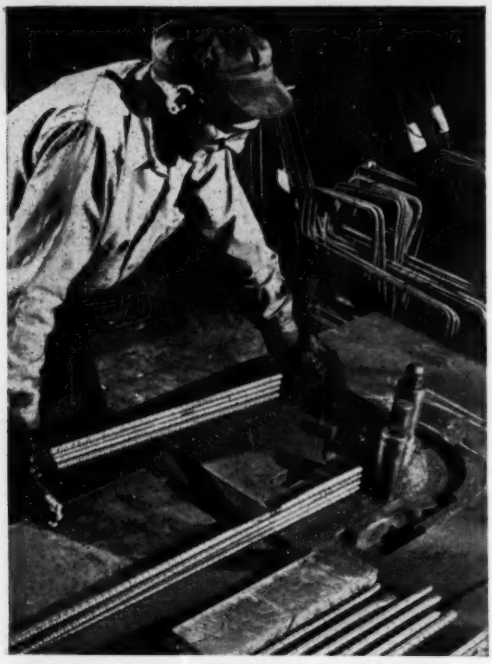
Returning to Los Angeles in 1946 the next four years were spent designing industrial and commerical buildings for engineering and contracting firms. The firm of G. F. Schreiber and J. L. Peterson, architect-engineer, was organized in 1950 and the consulting engineering firm, J. L. Peterson, Inc., was organized in 1953. Starting in 1948 Mr. Peterson began using precast concrete designs for buildings constructed in the Los Angeles area. Successful erection of these buildings led to the preparation of designs for precast structures constructed in 18 different states.

Roger H. Corbetta

Some interesting facts are disclosed and definite progress is noted in "Evolution of Concrete Construction," p. 501, by Roger H. Corbetta, president, Corbetta Construction Co., Inc., New York, N. Y. With 40-years background in the concrete construction industry, Mr. Corbetta has had many first-hand observations of improved methods in this field.

As president of Corbetta Construction Co., Inc., he has directed its concrete construction work on projects such as: the concrete LCT designed by the U. S. Navy in 1944 to conserve steel which combined precast sections, shotcrete, and cast-in-place construction, and duplicated the over-all dimensions and carrying capacity of the steel LCT; and the

Continued on p. 43



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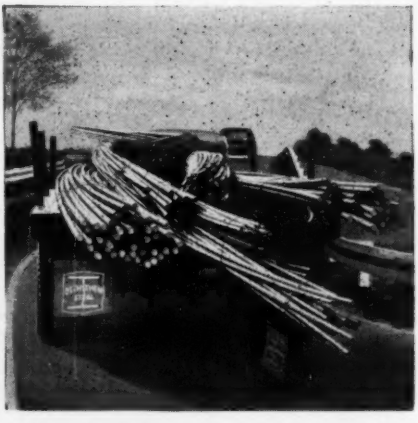

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Who's Who

Continued from p. 41

construction of the substructures, consisting of three reinforced concrete boxes for New York's Pier 57, which were cast 38 miles from the job site and floated down the Hudson River to their location in New York Harbor.

Also of outstanding mention are the long-span arch-rib construction of the American Airlines Hangar, Chicago, Ill., in 1947—probably the largest commercial hangar of this type in the United States at that time; and Forrestal Village, Great Lakes Naval Training Station, Upton, Ill., consisting of 1000 dwelling units, all precast including exterior sandwich walls, interior partitions, and floor and roof slabs.

Other notable projects are the Manhattan Apartments, New York, N. Y., one of the tallest reinforced concrete frame buildings in the United States, covering one city block and reaching 22 stories above street level; pier foundations for Tarrytown-Nyack bridge of the New York State Thruway consisting of 23 piers, eight of which are the buoyant type, constructed in a natural drydock in Haverstraw, N. Y., and floated 10 miles to the bridge site; and three U. S. Navy warehouses, Great Lakes Naval Training Station, which were constructed of precast triple-span rigid-frame bents, precast waffle roof slabs, and precast wall and canopy slabs.

Howard F. Peckworth

Howard F. Peckworth, managing director, American Concrete Pipe Assn., American Concrete Pressure Pipe Assn., and American Concrete Agricultural Pipe Assn., Chicago, Ill., reviews "Fifty Years in the Technical Development of Concrete Pipe," p. 513.

Mr. Peckworth received his education at Cornell University in 1923, and Princeton University in 1926, receiving from the latter a BS degree in engineering. From 1926 until 1941 he had charge of heavy construction work on tunnel subway and dam construction involving the placement of millions of cubic yards of concrete such as on sections of the 8th Ave. subway in New York, N. Y.; Tygart River Reservoir Dam, West Va.; Inland Dam, Ala.; Shasta Dam, Calif.; and Pinopolis and Santee Dams, S. C. In 1941 and 1942 he was editor of *Civil Engineering* and from 1942-45 was assistant to the secretary of ASCE. Since 1945 he has been in his present position with the concrete pipe associations.

Mr. Peckworth is a member of ACI Committee 210, Resistance to Erosion in Hydraulic Structures; Committee 323, Prestressed Concrete, and chairman of a task force subcommittee; and Committee 716, High-Pressure Steam Curing. He is secretary of ASTM Committee C-13, Concrete Pipe; Committee E7B, Concrete Pressure Water Pipe, of AWWA. He also serves on technical committees of ASCE, ASAE, APWA, and the Highway Research Board, the U. S. Chamber of Commerce, and has been consultant to the government of Ireland on drainage problems.

He is the author of the *Concrete Pipe Handbook* published by the American Concrete Pipe Assn., several other books, and many technical articles.

Ketchum and Konkel form partnership

Milo S. Ketchum and E. Vernon Konkel announced recently the formation of a partnership to specialize in structural engineering in Denver, Colo.

New Members

The Board of Direction approved 49 Individual applications, 8 Juniors, and 15 Students, making a total of 72 new members. Considering losses due to deaths, nonpayment of dues and resignations, the total membership for the month of December is 6352.

Individual

AMON, R., Istanbul, Turkey (Cons. Engr. & Contr., Rene Amon ve Albert Kurtaran ortakligi)
BALL, DR. FRANK J., Charleston, S. C. (Dir. of Research, West Virginia Pulp & Paper Co.)
BANKER, JOHN H., Chicago, Ill. (Constr. Supt., PCA)
BLACK, GEOFFREY DUNCAN, Cooma, Australia (C. E., Snowy Mtns. Hydro Electric Authority)
BUENAVENTURA, ANGEL P., Manila, Philippines (Chf. Des. Engr., National Power Corp.)
CASPARI, ROBERT W., Milwaukee, Wis. (Engr. & Constr. Supt., Dahlman Constr. Co.)
CIPLIAUSKAS, A., Toronto, Canada (Struct. Designer, Canadian Brazilian Serv., Ltd.)
CLEMENTS, JAMES R., Denver, Colo. (Pres., Gulick-Henderson Labs. of Colo., Inc.)
CORDES, HARRY H., Dixon, Ill. (Partner, C. K. Willett, Cons. Engrs.)
EDELEN, JAMES J., JR., East Orange, N. J. (Designer & Draftsman, Lars I. Moe Cons. Engr., Jersey City, N. J.)
FULLER, RUSSELL H., San Francisco, Calif. (Struct. Engr.)
GOLDES, A. A., Winnipeg, Canada (Designer of Reinforced Concrete Structures, Dominion Bridge Co.)
GRIFFITH, RICHARD F., Overland, Mo. (Constr. Engr., U. S. Corp. of Engrs.)
HAWTHORNE, ROBERT H., Niskayuna, N. Y. (Struct. Engr., General Electric Co., Schenectady, N. Y.)
HOFFMAN, L., Parana, Argentina (Supt., Cia. Argentina de Cemento Portland)
JACOBS, G. V., San Francisco, Calif. (Struct. Designer, Kaj Theill)
JOHNSON, THEO. A., Portland, Ore. (Gen. Contr.)
JOHNSTON, J. W., Huntsville, Ala. (Owner, Johnston Concrete Products Co.)
KNOPPE, WILLARD M., Anchorage, Alaska (Matl. Engr., Distr. Engr., Corp. of Engrs.)
KOSMAN, VICTOR, Sacramento, Calif. (Chf. Inspect., Folsom Power Plt., USBR)
KWAN, T. C., Toronto, Canada (Design Engr., Canadian-Brazilian Services, Ltd.)
LARSEN, T. D., Chicago, Ill. (Constr. Supt., Morris Handler Co., Inc.)
LINFORD, Preston D., Salt Lake City, Utah (Asst. Prof. of C. E., Univ. of Utah)
LING, DANIEL S., Detroit, Mich. (Associate Professor, Wayne Univ.)
LUQUE, JOSE LOYOLA, Mexico, Mex. (Comision Federal de Electricidad)
MALLIS, GEORGE A., Springfield, Mass. (Gen. Arch. E.)
MARTIN, RICHARD O., Wadena, Minn. (Selling & Gen. Operations of Plants, Wadena Silo Co.)
MENENDEZ, DR. BRUNO, Sierras Bayas, Argentina (Supt., Cia. Argentina de Cemento Portland)
NEMMER, JOHN, Pittsburgh, Pa. (Constr. Engr., U. S. Steel Corp.)
NERENST, POUL, Herlev, Denmark (Asst. Dir. of Research, Danish National Institute of Building Research)
NOVOTNY, W. E., Lombard, Ill. (Struct. Designer, A. J. Lindquist, Engr.)
OKAMOTO, TAKESHI, Tokyo, Japan (Struct. Engr., Antonin Raymond & L. L. Rado)
PADLASKY, WILLIAM, Philadelphia, Pa. (Partner, Schulcz & Padlasky, Cons. Engrs.)
PETROPOULOS, PANOS, Athens, Greece (C. E., Reinforced Concrete Design & Structures)
POOL, RICHARD BORKIN, Atlanta, Ga. (Asst. Prof. of C. E., Georgia Tech.)
RASHID, ABDUR, Lahore, Pakistan (Cons. Engr., Rashids Engrg. Corp.)
RUMPF, JOHN L., Philadelphia, Pa. (Assoc. Prof. of C. E., Drexel Institute of Technology)
SANDERS, W. G., JR., Atlanta, Ga. (Field Engr. & Concrete Technician, Master Bldrs., Cleveland, Ohio)
SCHWAB, ALVIN R., New York, N. Y. (Sales Engr., U. S. Steel Corp.)
SHEESLEY, JOHN D., JR., Johnstown, Pa. (Pres., Sheesley Supply Co., Inc.)
SHIPMAN, JOSEPH C., Kansas City, Mo. (Librarian, Linda Hall Library)
SIMETO, MARIO, Montevideo, Uruguay (C. E., Simeto, Bermudes y Simeto)
TRISK, S., London, England (Company Dir., Messrs. Tretol Ltd.)
TSO, L. S., Tainan, Taiwan (Lecturer in Civil Engrg., Taiwan College of Engineering)
WAGNER, JOHN B., Ashburton, Australia (Struct. Engr., Overseas Corp., (Aust.) Ltd.)
WHEATON, W. N., Ottawa, Canada (Laborer (Matls.), Dominion Building Materials, Ltd.)
WHITE, H. T., Whitley Bay, England (Designer, British Reinforced Concrete & Engrg. Co., Ltd.)
WILEY, WILLIAM EDWARD, Boston, Mass. (Serv. Engr., Master Bldrs., Cleveland, Ohio)
ZHUN, P. W., Lyndhurst, Ohio (Administrator, Sales Dept., Master Bldrs., Cleveland, Ohio)

Juniors

HATTRUP, JOHN S., Portland, Ore. (Struct. Engr., Corps of Engrs.)
HOSOYA, HIROMASA, Koide Niigata prefecture, Japan (C. E., Electric Power Development Co., Ltd.)
KIRCHHOFF, FRED, San Francisco, Calif. (Highway Engr.)
MICHAUD, R. H., W. Hartford, Conn. (Struct. Engr., F. H. McGraw & Co.)
LITTLE, J. D., JR., Oak Ridge, Tenn. (Design Engr., Carbide & Carbon Chemicals Co.)
PERRIN, HENRI L., North Bergen, N. J. (Struct. Design Engr., Ammann & Whitney, New York, N. Y.)
WEBER, ROBERT J., Milwaukee, Wis. (Struct. Designer, Worden-Allen Co.)
WRIGHT, RAYMOND J., Park Forest, Ill. (Struct. Designer, Hazelet & Erdal Cons. Engrs., Chicago, Ill.)

Student

AMADOR, RAUL KUHL, Managua, Nicaragua (Univ. Nacional de Nicaragua)
ATATIMUR, YALCIN, New York, N. Y. (Columbia Univ.)
BOCCALANDRO, ANTONIO, Boston, Mass. (MIT)
CASTELLANOS, GUILLERMO G., Berkeley, Calif. (Univ. of Calif.)
CRESPO, RENE A., San Francisco, Calif. (Univ. of Calif.)
GAVARRETE, RAMON CUADRA, Managua, Nicaragua (Univ. Nacional de Nicaragua)
GIRALDO, FABIO, Baton Rouge, La. (LSU)
JOHNSON, RICHARD, Pasadena, Calif. (Calif. Institute of Technology)
LEPPINK, ROBERT J., Laramie, Wyo. (Univ. of Wyo.)
PENALBA, GASTON RUIZ, Managua, Nicaragua (Univ. Nacional de Nicaragua)
PULIDO, RAUL JAVIER SANCHEZ, Tacuba, Mexico (Univ. Nacional Autanoma de Mexico)
SENIOR, ISAAC SCHEMEL, Madison, Wis. (Univ. of Wis.)
SCHMIEDEL, DUANE R., Warren, Pa. (Univ. of Cincinnati)
SEPP, JURI, Toronto, Canada (Univ. of Toronto)
ZUNIGA, JOSE MARIA OTERO, Managua, Nicaragua, (Univ. Nacional de Nicaragua)

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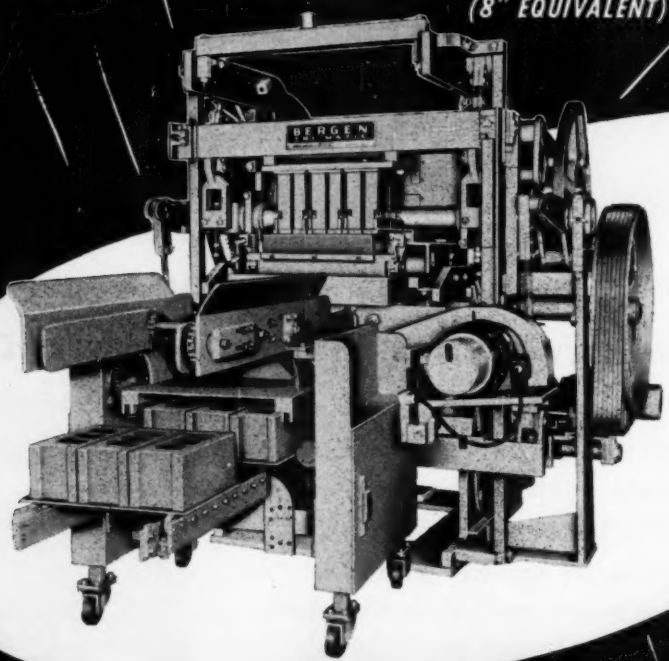

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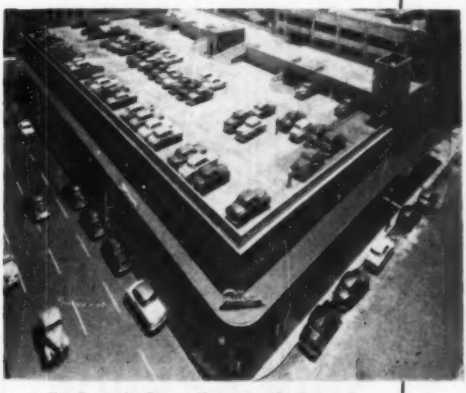

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The fact that rail steel reinforcing bars are actually delivering this kind of strength is extremely important today as architects and builders seek better ways to design concrete masses to resist shock.

A well known engineering equation

$$\text{Modulus of Resiliency} = \frac{\text{Yield Point}^2}{2 \times \text{Modulus of Elasticity}}$$

emphasizes the importance of the yield point as the real yardstick of shock resistance. Rail steel's modulus of resiliency, as measured by this equation, is 70 compared with 34 for intermediate grade steel.

In addition to this great strength, there are other benefits to you when you specify rail steel reinforcing bars. One is *uniformity* resulting from the rigid specifications under which rail steel's raw material has been produced. Another reason is the prompt and accurate *service* you get from the network of strategically located rail steel reinforcing bar manufacturers.

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SHOCKPROOF YOUR STRUCTURE WITH RAIL STEEL

Honor Roll

February 1—December 31, 1953

James A. McCarthy leads in "member-getting" this month with 15 credits. J. E. Jellick is in second place with 14 credits and Newlin D. Morgan, Jr., is now in third place with 9 credits. Robert F. Adams shares fourth-place honors with J. R. Florey and Joaquin Spinel L., each having proposed 7 applicants for membership in ACI so far this year.

James A. McCarthy	15
J. E. Jellick	14
Newlin D. Morgan, Jr.	9
Robert F. Adams	7
J. R. Florey	7
Joaquin Spinel L.	7
MacGregor S. Anderson	6
F. Thomas Collins	6
Samuel Hobbs	6
Henry L. Kennedy	6
Shigeo Okubo	6
C. H. Scholer	6
J. A. Thomen	6
Phil M. Ferguson	5½
Elmo C. Higginson	5½
Walter H. Price	5½
Herbert J. Gilkey	5
Carlos D. Bullock	4
K. A. Howard	4
William McGuire	4
Eugene Mirabelli	4
Lawrence L. Schwinn	4
M. A. Sozen	4
H. B. Tryhorn	4
W. S. Cottingham	3
Somthob Dhanuckamin	3
W. C. Hansen	3
Myle J. Holley, Jr.	3
J. B. Jacobsen	3
T. C. Kavanagh	3
W. R. Lorman	3
Eric C. Molke	3
E. R. Needles	3
Kiyoshi Okada	3
Fred F. Van Atta	3
Igor V. Voshinin	3
George D. Youngclaus	3
C. C. Zollman	3
Bernard S. Harder	2½
T. Y. Lin	2½
Platon T. Mikluchin	2½
Arbak A. Abdalian	2
Harold Anson	2
Hugh Barnes	2
Reinard W. Brandley	2
V. J. Cespedes	2
Edward M. Corbett	2
M. A. Craven	2
Hugh Doyle	2
A. D. Engle	2
Eugene Fallon	2
Benjamin P. Felix	2
E. M. Freeman	2
John Gilliland, Jr.	2
Roberto E. Guzman Herrera	2
K. Hajnal-Konyi	2
John M. Hayes	2
J. B. Herbish	2
Charles H. Hoopes	2
Chuzo Itakura	2
R. F. Jones	2
Charles F. Jost	2
M. B. Klock	2
Federico Leon	2
Gerardo Linores	2
B. W. Lorance	2
Robert L. Mauchell	2
Frank B. May	2
William G. Murphy	2
Leopoldo Notarbartolo	2
John P. Ottesen	2
Adrian Pauw	2
George Pinter	2
J. W. Reece	2
Juan Sarmiento	2
Leo W. Schmidt	2
C. P. Siess	2
Howard Simpson	2
George G. Smith	2
Herman Tachau	2
E. C. Thoma	2
T. W. Thomas	2
E. W. Thorson	2
Robert E. Tobin	2
C. B. Van Alstine	2
C. D. Wailes, Jr.	2
S. J. Warberg	2
Frank E. Watson	2
William H. Wisniski	2
Arthur G. Wood	2
B. R. Wood	2
J. S. Yike	2

Are

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"Member conscious"?

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DENVER

Shirley-Savoy Hotel

In ACI Journal next month

OTTO SAFIR describes an unusual reinforced concrete structure in "130-ft Span Hangar in Precast Concrete." The superstructure for the 130-ft free-span hangar was completely precast. Structural requirements, structural details, and erection details are covered. Full-scale test loading of one bent was carried out and an abstract is presented, together with cost figures for the completed superstructure.

The problem of determining the amount of water in a hardened concrete is covered by JAMES S. BLACKMAN in "Method for Estimating the Water Content of Portland Cement Concrete at the Time of Hardening." Comparison of three series tested shows that the original water content can be determined with reasonable accuracy. Water content at the time of hardening is estimated by determining the total water content of the hardened concrete sample after saturation by 24 hr immersion. The test involves drying the sample for 2 hr at 1100 F to determine water content.

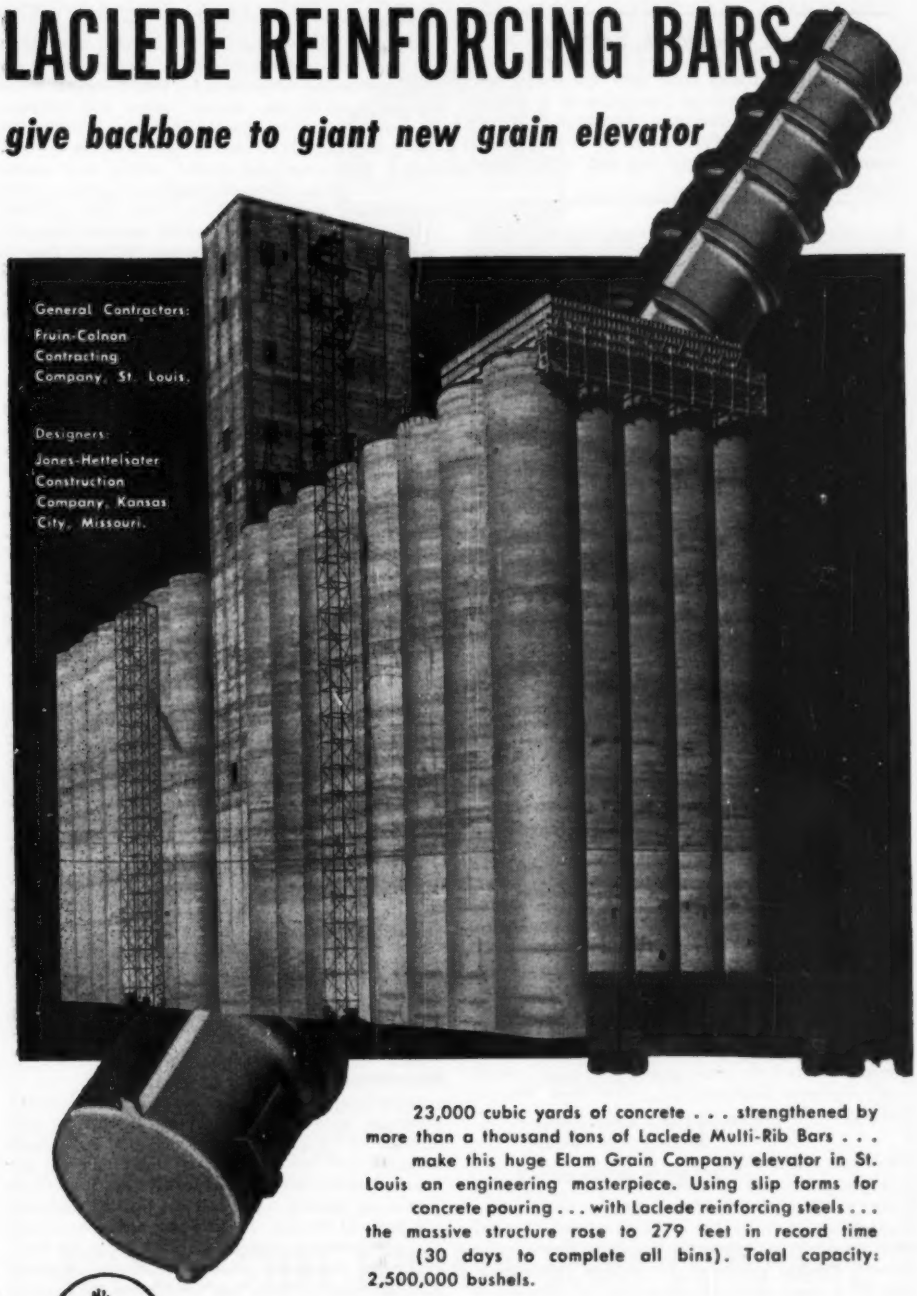
An unusual problem related to surging in pipelines is analyzed in "Control of Surging in Concrete Pipe Distribution Systems," by C. S. HALE, R. E. GLOVER, P. W. TERRELL, and W. P. SIMMONS, JR. The problem of surging manifests itself frequently in concrete pipe distribution systems provided with overflow pipe stands for preventing accumulation of static and water-hammer pressures. It appears in the form of a periodic variation of flow or surge which, in some cases, becomes so violent as to prevent delivery of water. This phenomena occurred for the first time in Bureau of Reclamation experience in the Coachella Valley pipe system, where some of the lines surged so persistently that it became necessary to make studies to determine the cause of this behavior and to find a solution. The tendency to surge is fostered by regularity of construction and is apt to occur where the topography permits pipe to be laid down section lines with a pipe stand at regular intervals. Studies show how surging can be controlled, within acceptable limits, by creating a nonresonating system, thus holding surge amplitudes to tolerable magnitudes.

A series of laboratory investigations covering "Static and Dynamic-Elastic Behavior of Reinforced Concrete Beams" are presented by JOSEPH PENZIEN and ROBERT J. HANSEN. Results indicate that strains of concrete and steel may be predicted with reasonable accuracy for both static and dynamic conditions of loading provided that: (a) proper allowance is made for creep and cracking of concrete, and (b) an exact dynamic theory is used with allowance for damping for the dynamic condition of loading.

"Lightweight Prestressed Concrete," by FRED E. KOEBEL presents results of preliminary tests on prestressed beams cast from lightweight shale concrete. Tests were made on similar beams with grouted and nongrouted prestressing steel. Results are plotted in graphical form and a brief discussion of the conclusions to be drawn from these data is presented.

LACLEDE REINFORCING BARS

give backbone to giant new grain elevator



23,000 cubic yards of concrete . . . strengthened by more than a thousand tons of Laclede Multi-Rib Bars . . . make this huge Elam Grain Company elevator in St. Louis an engineering masterpiece. Using slip forms for concrete pouring . . . with Laclede reinforcing steels . . . the massive structure rose to 279 feet in record time (30 days to complete all bins). Total capacity: 2,500,000 bushels.

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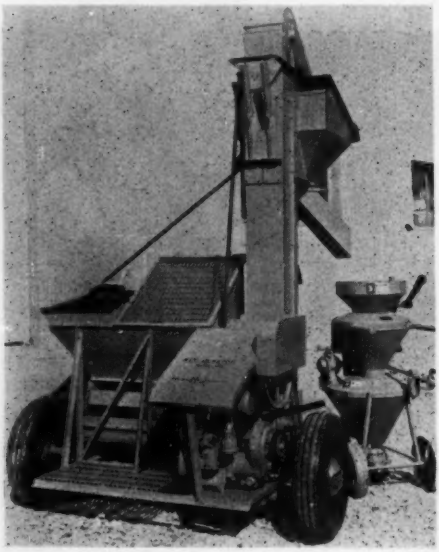
Tools, Materials, Services

Under this heading note will be made from time to time of producer literature of presumed technical interest (and available from its source for the asking) to ACI users of tools, equipment, materials, accessories, and special services.



Concrete gunning

Air Placement Equipment Co. has announced a combination proportioning, mixing, and elevating machine for concrete gunning operations called the Mix-Elevator. This machine is a portable, self-contained unit that is ready to operate when located at the material stockpile. An adjustable ratio contro permits a mixing range from 1:3 to 1:8. Engine speed can be adjusted to give a mixing and elevating capacity from 2½ to 8 cu yd per hr. A screening arrangement and a single clutch control require material or aggregate to be handled only once during the complete operation and allow one laborer to handle the entire operation alone if the stockpile is conveniently located. —Air Placement Equipment Co., 1009 West 24th St., Kansas City, Mo.

SR-4 strain gage capsule

A recent issue of "Testing Topics," V. 8, No. 3, 1953, published by Baldwin-Lima-Hamilton Corp., contains an article by Ala E. Fatin entitled "Bonded Wire Strain Gage Capsule for Measuring Strain in the Interior Body of Concrete." A capsule, consisting of two SR-4 gages mounted on a strip of celluloid, is moisture-proofed and embedded in concrete for measuring internal strains. Capsule is said to be unaffected by pressure of concrete during placing, measures both tension and compression, and is effective over a relatively lengthy period.—Testing Topics, Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

Joint sealers

Presstite Engineering Co. has released a catalogue on its line of cold applied paving joint sealers for use on concrete and bituminous highways, streets, bridge decks, canal linings, airport aprons and runways, and other heavy construction projects. Covered are laboratory data, specifications, and methods of application. Presstite cold applied paving joint sealers are described as sufficiently tough and elastic to withstand heavy traffic and cold and heat, with maximum adhesion and resilience to allow for repeated expansion and contraction of the pavement and still prevent infiltration of water and moisture. Application is also described as easy, rapid, and economical.—Presstite Engineering Co., 3786 Chouteau Ave., St. Louis 10, Mo.

Cold weather concreting

Calcium Chloride Institute has released Brief No. CB-4, entitled "Calcium Chloride for Concrete Construction," describing the use of calcium chloride in cold weather concreting. At normal temperatures, the bulletin states, the addition of 2 lb of $CaCl_2$ per bag of cement will reduce by one-third time required for both initial and final set. Time reductions will be even greater at lower temperatures. At 40 F $CaCl_2$ treated concrete is said to develop strength in one day equal to plain concrete at three days. The advantage of $CaCl_2$ in temperatures below 70 F is in the increased rapidity of heat liberation.—Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D. C.

Spickelmier enlarges plant

Spickelmier Co. held open house for builders and architects recently in their enlarged plant for production of Rapidex; the company's lightweight sectional slabs made of precast block for roofs and floors. Individual block that make up each unit slab section are made of coarse and fine Haydite aggregate and portland cement. Haydite concrete in these units has a compression strength of 3000 psi at 28 days. Design of the block provides a tongue-and-groove joint between unit slabs, and when joints are properly grouted, the entire deck area becomes an integral slab. Use of Haydite yields lightweight units in proportion to strength (8-in. Rapidex weighs 42 psf and 6-in. weighs 30 psf). A live load of 59 psf, on a 29-ft span, can be carried by the 8-in. units with two 1-in. diameter reinforcing bars.—Spickelmier Co., Indianapolis 5, Ind.

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Since Heltzel BUILDS IT BETTER 1910

Engineers long familiar with the HELTZEL name know it stands for quality equipment—built better for America's construction jobs large and small. But quality construction is only one factor of this Heltzel reputation. Quality engineering—*advanced thinking*—is equally important. The results of Heltzel's advanced thinking are evident today on construction jobs throughout the country.

ACCURATE CONCRETE BATCHING—Heltzel, for instance, pioneered the adoption of springless dial scale equipment for batching plants back in the days when volume batching was universally standard. Today, this type of weigh batching is standard. Tomorrow, perhaps, the advanced automatic batching equipment now being designed by Heltzel may become the standard method.

Heltzel emphasis on superior batch control is nowhere better found than in the tubular cement valve, which is exclusive with all Heltzel cement handling equipment.

Heltzel work with steel forms is another example of advanced design. Heltzel was the first to engineer and build dual-duty forms; the first to develop perfected dowel holding devices for the forms. Today, Heltzel's three types of airport forms permit engineers to design slabs up to 2 feet thick with the confidence that *standard* equipment is available for the job.

The penetration of Heltzel's advanced thinking is evident in the road building industry, in the ready mixed and concrete products fields—in fact, everywhere that concrete is used.

- PORTABLE BULK CEMENT AND AGGREGATE BATCHING PLANTS
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Membership in the American Concrete Institute

To facilitate prospective members in joining the Institute, membership application forms are provided. Present Members may aid by bringing these forms to the attention of those who may profit from membership advantages. The grades of membership are described overleaf.

All who have an interest in concrete and a desire to improve it through a nonprofit educational service in gathering, correlating, and disseminating information on design, construction, manufacture, use, and maintenance of concrete structures and products are eligible for Institute membership.

There are many opportunities in the Institute for technical committee activity, contributions from your experience in technical papers and the briefer "Letters from Readers" section, and in reviewing technical literature. Thus you can help further ACI's aim "to provide a comradeship in finding the best ways to do concrete work of all kinds and in spreading that knowledge," and at the same time benefit from the experiences of other Members.

(cut here)

Board of Direction, American Concrete Institute
18263 W. McNichols Road
Detroit 19, Michigan

Date_____

Individual Members, North America and U. S. Possessions	**$15.00**
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Student Members—nonvoting (under 28)	**5.00**

(Subject to stipulations of Bylaws—Article I on reverse side. Bylaws on request.)

Of the annual dues, $12.00 is for the JOURNAL of the American Concrete Institute (except that dues for Junior and Student Members apply in full for the JOURNAL).

The undersigned hereby applies for_____**membership**
(Individual, Corporation, Contributing, Junior, Student)

in the American Concrete Institute. Proposed by_____

For Corporation Membership, ACI representative will be_____

_____ _____
(Date of graduation if Student) (Name, if Corporation)

Signature_____

For our records, please complete both sides of application.

EXCERPTS FROM BYLAWS: ARTICLE I—MEMBERS

Section 1. This Institute shall consist of Members, Corporation Members, Contributing Members, Junior Members, Student Members and Honorary Members interested in furthering the Institute's objects as set forth in its Charter.

Sec. 2. A Member shall be an individual.

A Corporation Member shall be a firm, corporation, society, agency of government or other organization. A Corporation Member shall name one individual as its representative who will enjoy all membership rights and privileges.

A Contributing Member shall be an individual, firm, corporation, society, agency of government or other organization wishing to give larger support to Institute activities through the payment of larger dues. Contributing Members, other than individuals, shall name representatives as do Corporation Members.

A Junior Member shall be a person less than 28 years old.

A Student Member shall be less than 28 years old and a student in residence at a recognized technical or engineering school.

An Honorary Member shall be a person of eminence in the field of the Institute's interest, or one who has performed extraordinarily meritorious service to the Institute.

Sec. 3. All classes of Members except Honorary Members and Student Members, shall be proposed by at least one Member of the Institute and elected by a two-thirds vote of the Board of Direction. An Honorary Member shall be elected by unanimous vote of the Board of Direction. A Student Member shall be proposed by a member of his school's faculty, who need not be a Member of the Institute, and elected by a two-thirds vote of the Board of Direction.

Sec. 4. All Members shall have all rights and privileges of membership as determined by the Board of Direction except that a Junior or Student Member shall not vote nor hold office. The status of a Student Member shall change automatically to that of Junior Member on the first anniversay of his membership succeeding the date on which he ceases to be a student in residence. The status of a Junior Member shall be changed to that of Member on the first anniversary of his membership after he becomes 28 years of age.

Sec. 5. Applications for and resignations from Membership and requests for change of representatives of Corporation or Contributing Memberships shall be presented in writing to the Secretary-Treasurer. Resignations may be accepted only from Members whose dues are not more than 60 days in arrears, except by special action of the Board of Direction.

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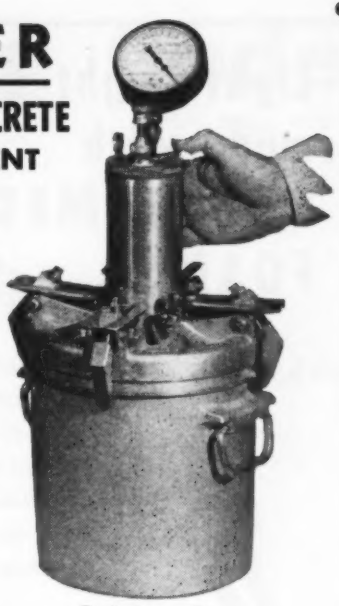

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Mortar mixer

Muller Machinery Co., Inc., announces a plaster and mortar mixer of 2 cu ft capacity. It is designed primarily for the small mason contractor or plasterer having a two- or three-man crew. For the larger contractor, too, it can be valuable as auxiliary equipment for use in places inaccessible to larger mixers. Weighing only 195 lb complete, it can be carried or hoisted to any location. The mixer is available with either a Briggs and Stratton air-cooled engine or an electric motor.—Muller Machinery Co., Inc., Metuchen, N. J.

Standards

A 20-page booklet, entitled "Through History with Standards," has been recently made available by the American Standards Assn. Development of some present-day standards is presented in a light vein, using cartoons to provide humor.—American Standards Assn., 70 East 45th St., New York, N. Y.

Floor protection

An illustrated four-page folder entitled "Floor Protection" describing the use of Metile steel floors for areas subjected to extreme production or traffic abuses has been released by Flash-Stone Co., Inc. Advantages of Metile steel floors are said to be durability and elimination of maintenance. Adequate anchorage provided by the concrete slab eliminates buckling or curling. Each steel plate has 53 anchors formed by punching. Concrete in which the plates are embedded rises through the holes to form surface islands, which eliminate slipping or skidding when water, grease, or oil are present.—Flash-Stone Co., 3723 Pulaski Ave., Philadelphia 40, Pa.

Early Equipment

Continued from p. 33

Mills were available which produced 700 barrels of cement per day with 85 percent passing the No. 200 sieve.

This brief description of some early machinery used in the concrete industry can but at best point out a few of the phases on the road of development of some machines. Many other fields of the concrete industry such as pipe production, transportation, and erection properly belong to a later era and will be covered in future issues of the JOURNAL.

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Absorption by Concrete of X-Rays and Gamma Rays—B. E. Foster

Effect of Sustained Overload on the Strength and Plastic Flow of Reinforced Concrete Beams—G. W. Washa and P. G. Fluck

Economical Design of Prestressed Concrete Beams—David P. Billington

Discussion closed February 1, 1954

Oct. Jl. '53

Proposed Recommended Practice for Selecting Proportions for Concrete—Committee 613

Development of a Cell for the Installation of Electrical Resistance Strain Gages—Herbert E. Worley and Richard C. Meyer

Failure of Concrete under Combined Tensile and Compressive Stresses—Gerald M. Smith

Correlation Between Laboratory Accelerated Freezing and Thawing and Weathering at Treat Island, Maine—Thomas B. Kennedy and Katharine Mather

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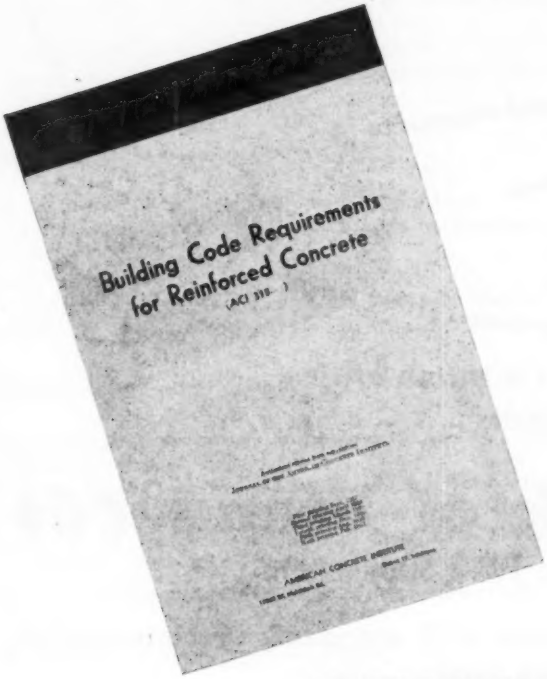
ACI Building Code

ASA A89.1—1951



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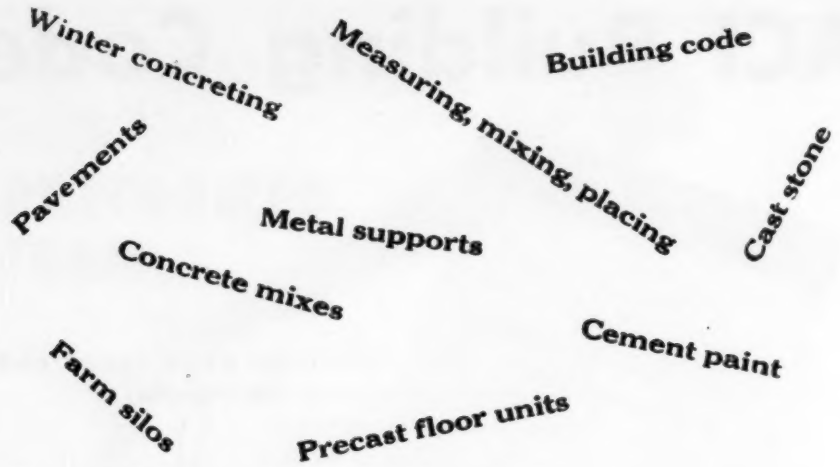

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